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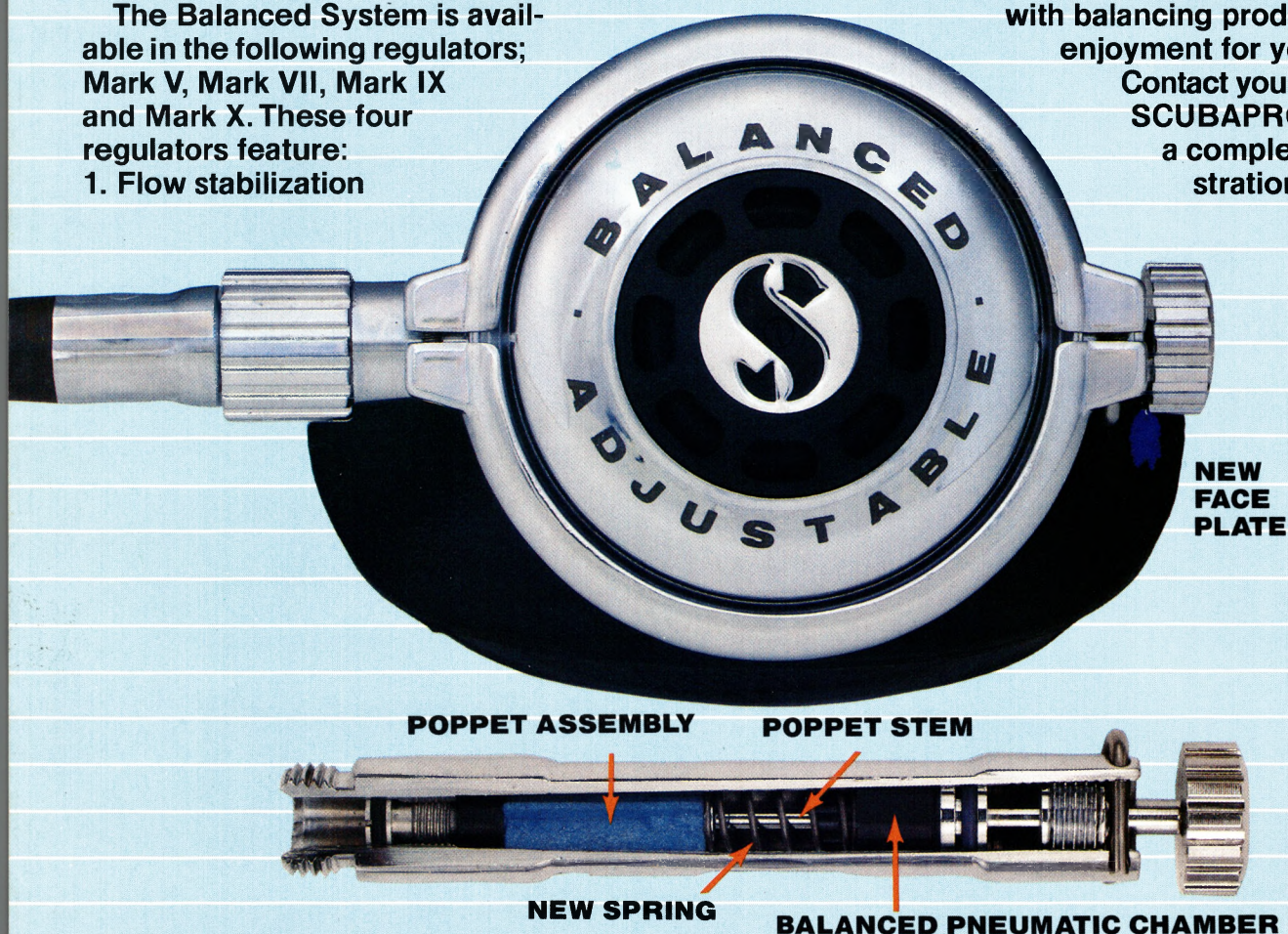
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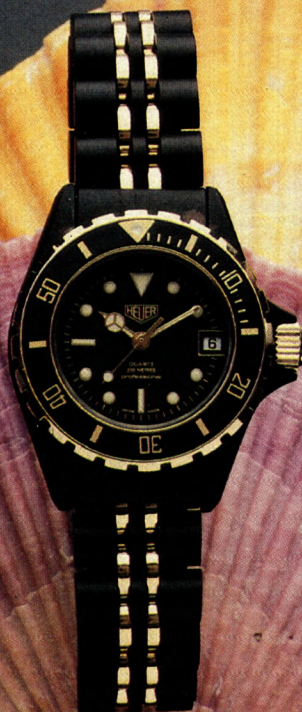
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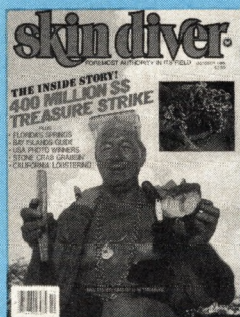


# skin diver

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## COVER

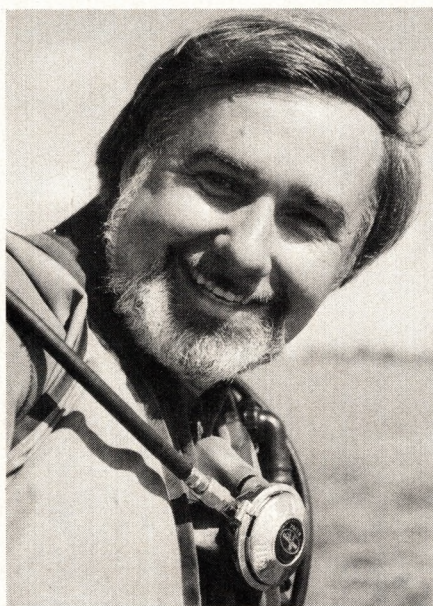
Mel Fisher displays some of the treasure recovered from the famous Atocha wreck, including a solid gold bar, golden chalice and (inset) lengthy money chain. Photos/Steve Lucas and (inset) Don Kincaid.

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# SDM Editorial

BY THE PUBLISHER



## AVOIDING DIVE TRAVEL RIP-OFFS

**D**uring the last ten years we have witnessed a tremendous boom in the dive resort and travel business. Each year the number of vacationing divers traveling outside the continental U.S. has grown. An estimated 350,000 people now go on overseas dive vacations somewhere in the world.

The dive resort industry has virtually exploded overnight; attracting hundreds of new operators, divemasters, instructors and underwater guides. Dive resorts are popping up like mushrooms throughout the Caribbean, Mexico, Central America, the Pacific and so on. Travel has become the fastest growing segment of the entire dive industry and has virtually become an industry of its own.

For the most part, resort dive operators are doing an excellent job despite the difficulties inherent in operating a business on a remote island. They have managed to keep their customers well satisfied with good dive experiences, competent services and a cordial attitude. However, there is a dark side to this booming dive/travel industry. Along with this modern day "gold rush" to the tropics, there comes a new wave of problems.

Scattered among the credible and established dive resort operators is a sprinkling of small, under-financed, shoestring operations. They are often one-man businesses with no backup personnel: No standby air compressor and no alternate boat. When an equipment breakdown occurs, the diving stops and the customer

is plain out of luck. At such operations, compressor or boat repairs frequently take weeks (sometimes months) because of the lack of parts or the ability to pay for such repairs. Some of these one-man shows are run by drifters—scuba gypsies—who set up a makeshift dive operation during the busy tourist season and then fade into obscurity when it is over.

Because much vacation diving is in foreign countries (developing nations), the level of dive safety is not the same as it is in the U.S. It can vary greatly from island to island and country to country. In some countries there are no controls or safety procedures and visitors dive at their own risk. Underwater guides are neither trained nor certified, and frequently conduct haphazard excursions.

Perhaps the greatest problem in overseas resort operations is irresponsible management. If the boat breaks down such operators feel no responsibility to seek alternate dive arrangements for their customers. Since they do very little preventive maintenance, equipment breakdowns become a common occurrence. Then there are more serious problems, such as rusty tanks, foul tasting air, low air fills and so on. Such problems exist because these operators lack formal training in business management; especially in the field of tourism.

In all fairness to the majority of dive resort operators, we must emphasize that such problems are actually rare. Judging from the letters received at SKIN DIVER, the incidence of travel rip-offs is approximately one percent of the overall business. Still, this amounts to several thousand disappointing vacations per year, and the low percentage of foul-ups is of little consolation if *you* happen to be one of the victims.

*What is a dive travel rip-off?* Simply defined, a dive travel rip-off occurs when you, the customer, have bought and paid for a dive vacation and end up with little or no diving. You have contracted for a

specific service that was never delivered because of a mechanical or personal failure on the part of the operator involved.

There is, however, a very definite distinction between a rip-off and an "act of God." Dive operators cannot be held responsible for tropical storms, hurricanes, cyclones, typhoons, or other natural catastrophes. Inclement weather, murky water and heavy seas are part of the normal risks of dive travel.

On the other hand, rip-offs are more readily defined as situations caused by poor management, lack of equipment maintenance, communication breakdowns or deliberate fraud. In other words, they are situations that could have been avoided if the dive operator had done his/her job. Here are just a few samples of what we mean:

A group of divers booked a ten day cruise aboard a dive boat and sent their money in advance. A couple of days prior to the scheduled departure, the boat skipper telephoned and sadly announced his boat had developed mechanical problems and would not be able to make the cruise. Fortunately, the skipper had arranged for an alternate boat, assuring his customers it was bigger and better than his own. The group flew off blissfully to the Caribbean for this ten day dream vacation. Upon arrival at the pier, the group was horrified to learn that the sub-chartered dive boat had no cook, no crew, no food and a surly skipper. The group was further advised that the original dive boat had been out of commission for almost two months and that its skipper had not been completely truthful in his dealings. With their money gone, and no prospects for food in the immediate future, the group returned home without making a single dive.

Two divers read a newly published advertisement about a super low price dive package offered by a swank high-rise hotel in the Caribbean. Sending a deposit in

*(Continued on Page 114)*





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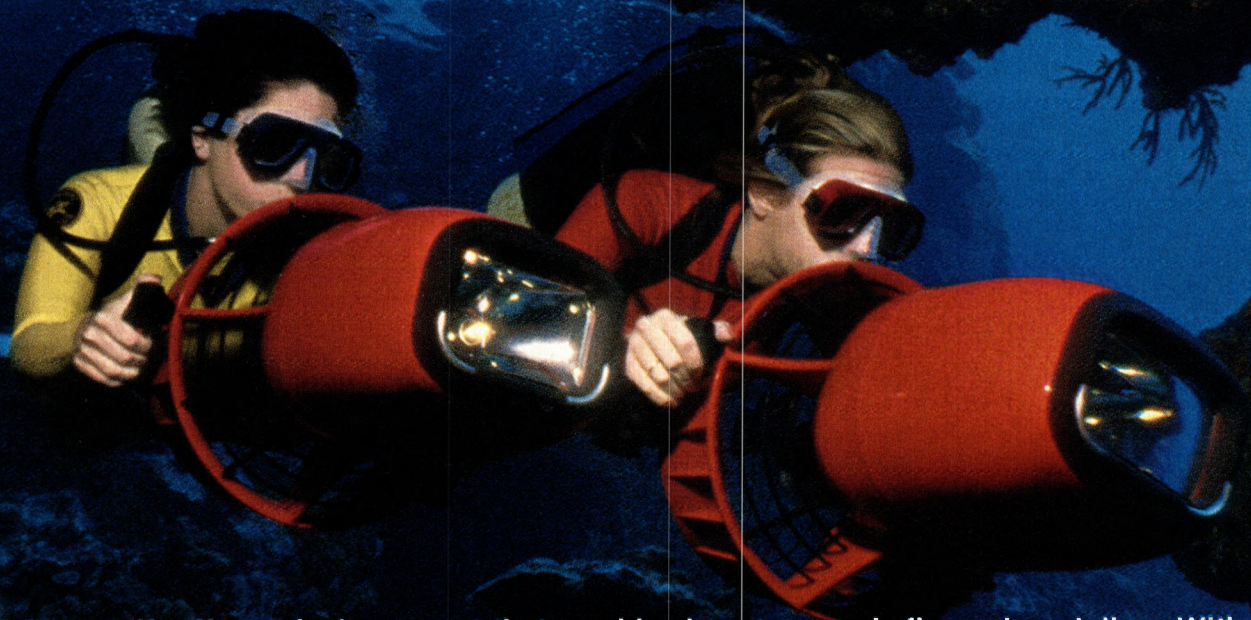
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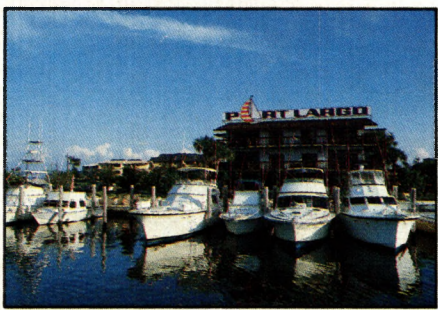
## A photograph of a tropical resort area. In the foreground, there is a swimming pool with a red and white border. To the left of the pool is a small, dark wooden building with a thatched roof. Several lounge chairs are scattered around the pool area. The background is filled with numerous palm trees and a clear blue sky. The ocean is visible in the distance.

An aerial photograph of a tropical resort. In the upper left, there is a swimming pool with a blue cover. To its right is a lounge area with several sun umbrellas and a small building. Further right, a small boat is docked in the turquoise water. The resort is surrounded by lush greenery and palm trees. The water is a vibrant turquoise color, and the sky is a clear, pale blue.

A collection of Nikonos underwater cameras and accessories arranged on a sandy beach. The items include a Nikonos V camera body, two Nikonos SB external flash units (labeled 102 and 103), a blue air tank, a snorkel mask, a pair of sunglasses, a starfish, seashells, and a glass of orange juice with a cherry. A small black metal stand is also visible.



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# Scuba Quiz

## Category: Physics

### Topic: Humidity

By Dennis Graver

By definition, humidity is the degree of wetness of the atmosphere. The quantity of water vapor in the air affects divers in several ways and it is important for us to understand these effects and their causes. Test your understanding with this month's quiz. The answers are on the following page.

**1. The partial pressure of water vapor in a gas is governed entirely by:**

- ☐ A. The temperature of the gas
- ☐ B. The pressure of the gas
- ☐ C. The density of the gas
- ☐ D. All of the above

**2. The relative humidity of a gas is:**

- ☐ A. The ratio of the amount of water actually present to the amount of water vapor that could be present
- ☐ B. The amount of moisture present compared to the amount of moisture in the surrounding atmosphere
- ☐ C. The ratio of the amount of water present in the air compared to the standard amount of moisture

**3. Compression raises the relative humidity of a gas, while expanding a compressed gas reduces the relative humidity.**

- ☐ True
- ☐ False

**4. The amount of humidity in the air affects the cooling capability of the human body.**

- ☐ True
- ☐ False

**5. Dehydration in a scuba diver:**

- ☐ A. Occurs because the dry air breathed is humidified with moisture from the diver's body
- ☐ B. Increases the likelihood of decompression sickness
- ☐ C. Should be prevented by frequent ingestion of fluids
- ☐ D. All of the above

**6. Freezing of the second stage of a regulator is likely to occur when:**

- ☐ A. A diver exhales into the regulator above water when the temperature is below freezing
- ☐ B. A diver fails to breathe through the regulator prior to submerging in near-freezing water
- ☐ C. The second stage has not been modified with an anti-freeze solution
- ☐ D. None of the above

**7. Freezing of the first stage of a regulator can occur when:**

- ☐ A. A diver exhales into the regulator above water when the temperature is below freezing
- ☐ B. The cooling effect of air passing through the stage freezes the water inside
- ☐ C. A regulator is immersed and then exposed to sub-freezing temperatures
- ☐ D. B or C, but not A

**8. The use of an extra second stage (octopus) on a regulator increases the likelihood of regulator freeze-up in cold water.**

- ☐ True
- ☐ False

**9. Condensation inside a mask forms from moist air caused by:**

- ☐ A. Water vapor in air exhaled into the mask
- ☐ B. Evaporation of moisture from the face
- ☐ C. Evaporation of moisture from the eyes
- ☐ D. All of the above

**10. Mask defogging is effective because:**

- ☐ A. It absorbs moisture from the air inside the mask
- ☐ B. It prevents water from condensing on the lens of the mask
- ☐ C. It combines with the moisture to form a new compound
- ☐ D. None of the above



# Scuba Quiz

## Answers: Humidity

### 1. A. The temperature of the gas.

When a given quantity of gas is exposed to water, water will evaporate into the air until the air is saturated. If the air is then warmed, it will absorb more water; but if cooled, the water vapor will condense. This phenomenon occurs regardless of the pressure, density or volume of the gas.

**2. A. The ratio of the amount of water actually present to the amount of water vapor that could be present.** More specifically, relative humidity is the ratio, expressed in percent, of the amount of water actually present in a gas mixture to the amount of water vapor that could be present if the mixture were saturated at the same temperature.

**3. True.** When a moist gas is compressed into a constant volume receiver, water is continually added to the container until a point is reached where the addition of more air results in condensation of water inside the container. By contrast, when a compressed gas is expanded, the relative humidity and the partial pressure of water vapor in the gas are decreased. This is why compressors have water traps and why air supplied to a scuba diver from a tank is very dry.

**4. True.** If the surrounding air is hot and the humidity is high, cooling of the body by evaporation is greatly inhibited.

For this reason, divers should use caution during preparations for diving in hot, humid climates. When body heat production cannot be offset by heat loss, heat exhaustion or heat stroke can occur.

**5. D. All of the above.** Each breath taken is humidified with moisture supplied by the body, thereby reducing body fluids. This can result in a thickening of the blood and lead to decompression sickness. Dehydration must be prevented by keeping the body well hydrated. Drinking fluids before and between dives is recommended. Rinsing the mouth with water while diving is also a good idea provided the water is not polluted.

**6. A. A diver exhales into the regulator above water when the temperature is below freezing.** The relative humidity of exhaled breath is 100 percent, and the moisture in the breath can freeze inside the second stage. To prevent this, only exhale into the regulator when it is submerged where the temperature is above freezing.

**7. D. B or C, but not A.** First stage freezing is not related to humidity like second stage freezing is. When compressed air is expanded, its temperature is lowered. This, combined with near-freezing water present on the diaphragm of the first stage, can be

enough to cause ice crystals to form and interfere with the operation of the first stage. Freeflow begins, which further compounds the problem. If a regulator first stage is immersed, then exposed to freezing temperatures, the water inside can freeze. Both problems described can be prevented by means of anti-freeze kits.

**8. True.** Since expanding air cools the first stage, the more air involved the greater the cooling and the greater the chances of freeze-up. Use of an extra second stage is a good idea, but if one is used in near-freezing water, be sure your regulator is equipped with an anti-freeze kit.

**9. D. All of the above.** Water vapor from any source will be absorbed by the air in the mask until the air is saturated at a given temperature. When the air is cooled by immersion, the temperature of the air in the mask is lowered and the water vapor condenses inside and on the lens of the mask.

**10. B. It prevents water from condensing on the lens of the mask.** The cause of fogging is the "beading" of water droplets on the lens. This can be prevented by treating the surface with a defogging compound that reduces the surface tension of water so it flows off in a thin sheet rather than condensing into tiny droplets. The secret of a clear mask is a clean lens.

*As you can see, there is more to humidity and diving than many divers realize. By understanding the effects of humidity and their causes, your diving can be safer and more enjoyable. Not many diving texts address this topic in detail, but you can learn more about humidity and other important topics through continued education in diving. This is just one more reason why advanced and specialty training are recommended.*



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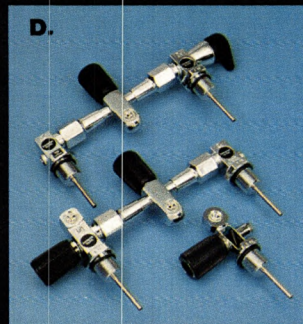
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C.



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E.

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BY ELLSWORTH BOYD

In 1717, more than 1,500 pirates were preying on Atlantic coastal shipping, but only a few are remembered today. Ask the average person to name a pirate and nine out of ten will reply, "Captain Kidd." George Eichelberger, Hockessin, DE, asks: "Is there any truth to the existence of buried or sunken treasure left by the notorious pirate, Captain Kidd?"

Although no sunken treasure has been rumored in history books, some of Kidd's buried loot is supposed to be on Gardiner's Island, off Long Island, New York. The irony of Captain Kidd is that his career was so short for such a famous buccaneer. His father was a minister who made sure his son received a bona fide education. An honest seaman for many years, Kidd commanded an English privateer in American waters and had a wife, children and a home in New York.

In 1695, the governor of Massachusetts chose Kidd to suppress pirates who were sailing the New England coast. In 1696, Kidd left New York aboard the *Adventure Galley*, accompanied by 155 officers and crew, one of whom he killed at sea. Kidd, in an argument with his chief gunner, William Moore, struck Moore in the head with an iron bucket. Moore died the next day and it was this act, not piracy, that brought Kidd to the gallows.

Kidd and his crew worked on a "no prizes, no pay" basis. "Prizes" meant plundering other vessels. The *Adventure Galley*, her fittings, armaments and stores, were paid for by a company consisting of lords and dukes who were to receive equal shares of the booty. When they didn't hear from Kidd, rumors spread that he was capturing and keeping treasure and orders were issued for his arrest.

Kidd captured several small ships and finally took the largest prize of all—the *Quedagh Merchant*, a 500 ton vessel loaded with silk, sugar, jewels, silver and gold. Kidd's quests took him from Mada-

gascar to Hispaniola, Anguilla and back to Boston. Although he protested his innocence of piracy, there was no doubt he had killed William Moore. Kidd was taken to England, found guilty and hung in 1701 at age 56. Tales of his legendary treasures continue to be spun nearly 300 years after his demise.

Lee Spence, Sullivan's Island, South Carolina, isn't spinning tales of treasure—he's out looking for it. He's searching the *City of Veracruz*, a steamship wrecked in 1885 off Pt. Canaveral, Florida. Resting in 75 feet of water, the ship is supposed to have a large quantity of jewelry aboard. Working outside the three mile limit, Spence and his crew have avoided the state bureaucracy and have obtained rights to the wreck in federal court through Admiralty Law. They are also custodians through Admiralty Law of the *Delia Maria*, sunk in 30 feet, a little more than three miles off Charleston, South Carolina. An 1854 square rigged sailing vessel heading from Liverpool to Charleston, the *Delia Maria* contains 60 tons of china, silver and other valuables.

Stephen Hinkley, Borger, Texas, asks about the wrecks *Maria Theresa*, *Jesse* and *S.J. Lee*. The *Maria Theresa* sank in 1880 in Brazos Pass off Padre Island, Texas. Gold was reported on board and her loss was estimated at \$210,000. Check the location on U.S. Coast and Geodetic Survey Charts: #1117 Galveston to Rio Grande and #1288 Southern Part of Laguna Madre. The *Jesse* foundered on a sandbar off the mouth of the Rio Grande in 1875. Gold and silver were reported on board and her loss was estimated at \$100,000. Check the same charts for this vessel. The *S.J. Lee* was a steam side-wheeler, 176 tons, built in 1866 and sunk in 1873. A steel vessel, she was stranded off Brownsville, Texas. Another vessel with the same name was lost off Brazos, Texas [225 miles to the northeast] in 1873. She was purported to

be carrying treasure worth \$100,000.

Greg Fortner, Norfolk, Virginia, asked about the *Nuestra Senora de Guadalupe*, sunk off Ocracoke, North Carolina. William Hughes, State College, Pennsylvania, supplies the following: "Our *Lady of Guadalupe* was under the command of Don Juan Manuel de Bonilla. As a result of several severe storms, she came to rest in Ocracoke Harbor, not the inlet. When the crew abandoned the pumps, the ship sank to her upper decks. Much of her cargo of silver and diamonds was salvaged and later stolen by pirates. The *Guadalupe* was in a 1750 fleet with the *Galga* and five other ships."

Many New Jersey divers are friends with Gary Gentile from Philadelphia, Pennsylvania. A photographer and author, Gary has collected fascinating artifacts such as silver, pottery, china, port-holes, guns and bottles from New Jersey wrecks. He has restored all of his finds and many have been displayed at the New Jersey State Museum in Trenton. "Although the deeper wrecks contain more artifacts," Gary says, "the more explored, shallower wrecks still yield port-holes, bottles, plates, silverware and other mementos." Gary has written an article about preserving artifacts. Divers may write to him at 7408 Shisler St., Philadelphia, PA 19111.

Christopher York, Moundsville, West Virginia, wants information on the French frigate, *La Jean Florin*, and the American steamer, *Chesapeake*. The French vessel sank in Lake Erie in July 1721, between 10 and 15 miles off Erie, Pennsylvania. Gold and silver were reported aboard and losses totaled \$500,000. A *Guide to Sunken Ships in American Waters* lists: latitude 42-18.0, longitude 79-54.1. The *Chesapeake* sank in June 1847 with \$8,000 in specie reported on board; latitude 42-01.5, longitude 80-34.0. Try to obtain U.S. Army Corps of Engineers charts covering the Great Lakes: #3 Lake Erie and #33 Coast Chart, East End of Lake Erie, Morgan's Point, Ontario to Surgeon Point, New York, including Niagara River and Welland Canal.

Lester Newell, Underwood, Washington, lives close to the border of Washington and Oregon, approximately 150 miles from the coast. He has a cabin cruiser and wants information on northern Pacific Coast wrecks. Several books have just what you're interested in, Lester. Try *Oregon Shipwrecks* by Don Marshall and *California Shipwrecks—Footsteps in the Sea*, also by Marshall. Author James Gibbs has written two valuable resource books: *Pacific Graveyard* and *Shipwrecks of the Pacific Coast*. Both Gibbs and Marshall have recorded detailed accounts of major marine disasters in man's struggle against the sea. These books may be ordered from Polly Gardener, Binford and Mort, P.O. Box 42368, Portland, OR 97242.

Divers have been asking about ship-  
(Continued on Page 123)



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# DIVING MEDICINE

BY ALFRED A. BOVE, M.D., PH.D.

## MORE ON BC BREATHING

*There are usually several points of view on every subject. In January, we presented a column by Al Pierce on buoyancy compensator breathing in out-of-air emergencies. Russell Donnelly, a PADI master instructor from Goose Creek, South Carolina, has another opinion, which is offered below—followed by further comments from Pierce—F.B.*

**B**reathing from a buoyancy compensator or stabilizing vest involves dangers that are not offset by any emergency or safety considerations. The article by Al Pierce (January 1985) assumes many abstract concepts that in practice may not achieve the same results.

Pierce assumes the average diver is a man of steel, capable of five to ten complex decisions per second, with the calmness of a Tibetan monk, the devil-may-care attitude of Errol Flynn, and the cold logic of Mr. Spock. Such divers are rare in sport diving. Scuba is a weekend sport and often may only involve a once-a-year trip to a tropical island. Ask any divemaster in a busy diving resort about the skill and competence of the divers he sees. Sport divers don't have the training or experience of Navy divers. Within reason, it is the responsibility of the training agencies, the resorts and the individual instructors to ensure that each open water diver is the safest diver he/she can be, allowing for available time and training. We must teach the simplest, easiest and safest method of diving possible, something that will be remembered and used two years later. In my own program, I teach the use of an extra second stage (octopus). Other emergency rigs, such as the pony bottle with separate regulator, are better, but cost, maintenance and availability tend to make these other choices prohibitive in actual practice.

The trend is toward octopus training and, in my opinion, the dive shop that does not teach it is neglecting an important aspect of training. Eventually, all divers will be trained in the use of octopus rigs. In an out-of-air emergency, if your buddy doesn't have an octopus, your next step is buddy breathing and if that fails, the proverbial "blow and go." There is no room for BC breathing. Mechanics, hygiene and safety are the main reasons

I've decided against this idea.

The mechanics of Pierce's idea are: The diver gives his out-of-air buddy his second stage, retrieves his BC hose, purges the water out of the mouthpiece, presses the exhaust button or rolls over so water flows to the bottom of the BC (an inverted diver with an out-of-air buddy is an interesting problem) and breathes through any water accumulated in the BC hose. The diver and his buddy must decide whether to drop weightbelts, fill BCs (assuming power inflators are used) or swim up. The option of firing a CO<sub>2</sub> cartridge is not available. During this time, the BC exhaust button must be held down or water will enter, so the diver has only one free hand to handle his buddy's weightbelt, loose mask, etc. How much air should be in the BC? If the BC's internal air expands, causing the over-pressure valve to pop off, there is a risk of uncontrolled ascent and air embolism. A sticky pressure relief valve can cause the diver to spend the rest of his weekend in a recompression chamber. So far, the buddy breathing concept is much easier, but it is a skill that is difficult to master and more difficult to maintain. The multiple maneuvers needed to accomplish BC breathing safely might require the diver to be a skilled juggler.

Hygiene may also be a serious problem. Most BCs contain bacteria or fungus that could cause serious lung infection. Pierce advises a regimen of frequent rinsing with Roccal, or Zephiran Chloride. After talking to a pharmacist, I discovered that Zephiran Chloride in full strength can burn ulcers on skin or bronchial tubes. Pierce feels there is little risk of pneumonia. There have been cases of pneumonia from contaminated hoses in double hose regulators. The infection may be caused by exotic organisms that are hard to cure. A diver would be comfortable breathing from his own BC provided he gave it a total cleaning after each dive. But, many divers don't rinse the inside or outside or their BC after diving.

Safety may also be a problem. I recommend power inflators for every diver, but not all divers use them. If they do not, then for safe rebreathing from a BC the diver must discard the CO<sub>2</sub> cartridge even though it is a safety device. Pierce states that CO<sub>2</sub> can be tasted as carbonic acid, but what does the diver do if the BC contains CO<sub>2</sub>? Breathing from a BC with a

loaded CO<sub>2</sub> cartridge could be risky; the cartridges may be fired accidentally. By the time you realize you are breathing CO<sub>2</sub> it may be too late. Breathing a gas other than normal air is very dangerous—period. There have been numerous industrial accidents from inhalation of gases lacking in oxygen—these are not to be fooled around with. They can kill without warning, and underwater the dangers are much greater.

It is a foolish diver who makes a deep dive without adequate safety gear. Divers should use an octopus for safety, especially when diving deeper than 30 feet. At depths greater than 100 feet, divers are subject to narcosis, decompression sickness, gas embolism and drowning. Problems such as carbonic acid, lung infection, inhaling water, etc., are nonexistent with an octopus. If a diver has spent \$1,000-\$2,000 on diving equipment, addition of an octopus rig is a small matter. The octopus rig is a better choice than breathing from your BC, and the cost is not substantial. Like depth and pressure gauges, power inflators and other safety equipment, the octopus is becoming an accepted part of diving.

I hope I've made a few points clear. Diver safety should always be considered first, before accepting controversial ideas from a few individuals. Untested ideas can be harmful in diving. Anything that hurts one diver hurts all.

## AL PIERCE RESPONDS

I welcome Russell Donnelly's comments on BC rebreathing. Like all scuba skills, breathing from a buoyancy compensator takes practice. But it doesn't require a "man of steel." It is simply one of a number of solutions to the all too frequent out-of-air problem that shouldn't happen, but does. Before I wrote my first article on emergency breathing from a BC (Proceedings of IQ 11), I learned of four persons who had used this technique to obtain air in emergency situations. More have done so since.

I agree that a pony bottle is a better solution when out of air and that cost and availability (especially at a dive resort) make it impractical for the average diver.

The following paragraphs respond to Donnelly's objections to BC breathing.

*Carbon Dioxide in the BC:* To be ready for emergencies, form the habit of flushing  
(Continued on Page 121)





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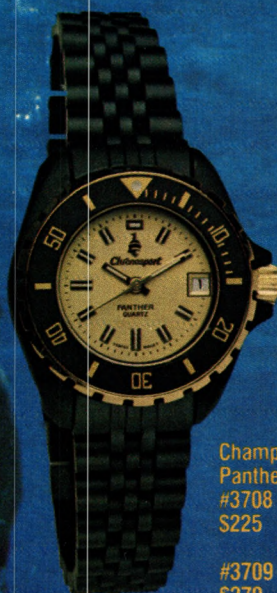
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# Technifacts

BY E.R. CROSS



The stage was set for an unusual diving and salvage job when the fishing vessel *Carolyn K* slammed into the southwest corner of the barrier reef near Disappearing Island at French Frigate Shoals. The *Carolyn K* hit the reef bow-on at cruising speed just before dawn on February 6, 1985, bounced across a couple of miles of half-submerged coral heads and was finally able to get an anchor down in about 35 feet of water in the lee of the extensive reef area.

French Frigate Shoals is part of the chain of islands and reefs making up the Hawaiian Islands. It is about 450 miles northwest of Honolulu. The United States Coast Guard maintains some unmanned navigational aids on Tern Island, basically

a man-made airstrip about as large as a small carrier flight deck. A man and wife research team were on Tern Island at the time the *Carolyn K* grounded.

Most of the underwater part of the bow of the vessel was smashed in or missing. Long cracks in other parts of the hull were leaking. The research team on Tern Island was reached by radio. They, in turn, radioed the Coast Guard and an insurance company in Honolulu about the grounding of the vessel. Later in the day, when the *Carolyn K* was obviously sinking, the three man crew was safely removed by fishermen from the *Faresa*.

On February 8, Pat Wolter of American Divers, a Honolulu based diving and salvage firm, flew to Tern with the insurance

adjuster. After an inspection, an agreement was reached for Pat's firm to salvage the vessel and tow it to Honolulu for drydock, inspection and possible repair.

Time is a critical element in the successful salvage of a vessel sunk in shallow water. Any kind of heavy weather can cause additional, extensive damage owing to movement of the vessel against the ocean bottom. Wolter had radioed his diving and salvage crews to mobilize for the salvage of the *Carolyn K* and, in Honolulu, the *Holo Kai* was being readied for the voyage to French Frigate Shoals.

Twenty, one ton liftbags were put aboard the *Holo Kai*. Helmet, bandmask and scuba gear were loaded. Two air

(Continued on Page 116)

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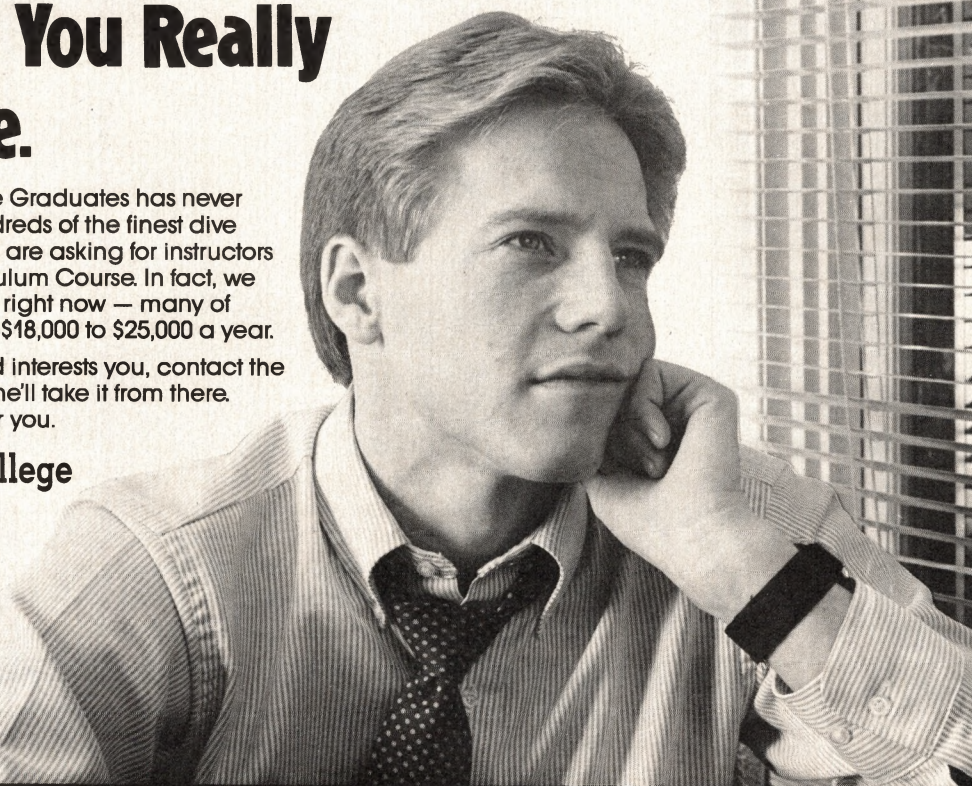
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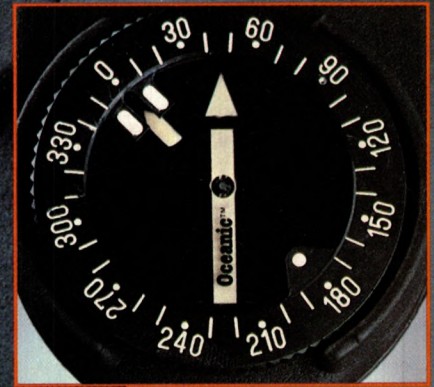
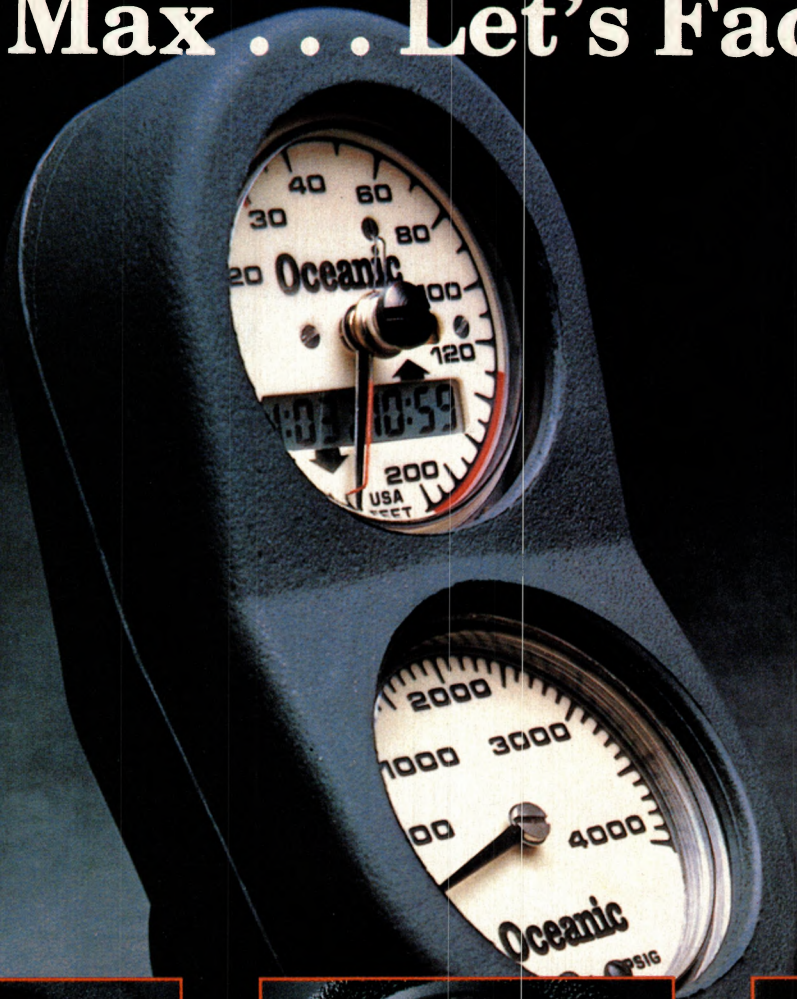
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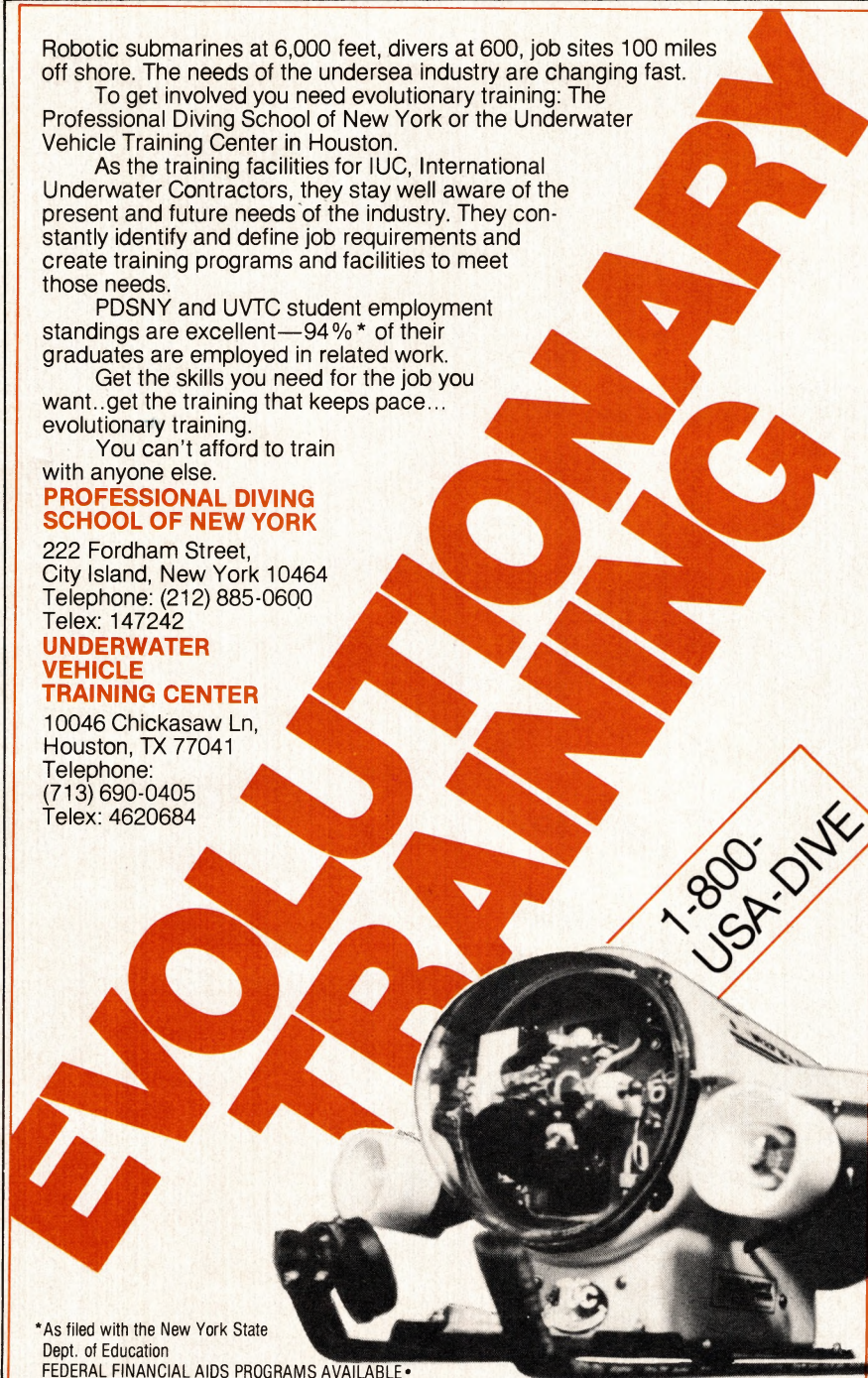
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## Diver's Calendar

**October 5** Diver's Day III conference on underwater education, presented by NAUI, the American Littoral Society and the University of Tampa—to be held at the University of Tampa, Florida. Evening film festival with Stan Waterman. (Contact: Ed Uditis, Box 136F, University of Tampa, Tampa, FL 33606)

**October 12** An Evening With Stan Waterman, 8:00 pm, McCosh Hall, Princeton University, Princeton, NJ. (Contact: Princeton Scuba Club, P.O. Box 160, Princeton, NJ 08550 or phone Princeton Aqua Sports (609) 924-4240)

**October 12** Great Lakes Chapter of the Undersea Medical Society annual meeting and film festival, Buffalo, New York. Open to the public. (Contact: Bill Norfleet, Hyperbaric Research Lab, SUNY at Buffalo, 124 Sherman Hall, Buffalo, NY 14214; (716) 831-2746)

**October 19-26** Diving Accident and Hyperbaric Oxygen Therapy course on Grand Cayman Island. (Contact: Cindi Easterling, Box 3108, Duke University Medical Center, Durham, NC)

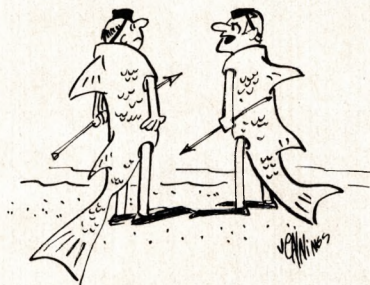
**October 23** Shell Auction, sponsored by the Greater Miami Shell Club in the auditorium of the Rosentiel School of Marine and Atmospheric Science, Miami. (Contact: Sandra Gayle Motes, 4525 W. 20th Ave., C524, Hialeah, FL 33012)

**October 26** Caltech Film Festival, featuring Jim and Cathy Church, Beckman Auditorium, Pasadena, CA. Slide shows, films. (Contact: (818) 356-4652)

**October 27** Fifth Annual Underwater Pumpkin Karving Kontest to benefit the YMCA Family Stress Center for abused kids. Event held in Bonita Cove, Mission Bay, San Diego, CA. (Contact: The Wet Set (619) 578-DIVE)

**November 9** Fourteenth Annual Inward to the Sea underwater festival, downtown Washington, D.C. Daytime seminars (\$7), evening film festival (\$7)—hosted by Stan Waterman. (Contact: Inward to the Sea, P.O. Box 17502, Washington, D.C. 20041-0502; (703) 938-5325)

**November 14-17** Sea Ventures Expo, Los Angeles Convention Center. Films, fashion shows and seminars for all watersports. (Contact: (213) 316-6140)



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Photograph by Steven M. Barsky

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## Film Festivals 'n Symposiums

### CAPE COD TREASURE

Cape Cod Divers, Inc. will host its third annual Treasure Hunt October 5 in Harwich Port, Massachusetts at 10:30 am. Preregistration is \$25. More than \$2,500 in prizes will be awarded and T-shirts and lunch are included.

For information contact: Cape Cod Divers, Inc., 815 Main Street, Harwich Port, MA 02646; (617) 432-9035. 🐠

### UMS FESTIVAL

The Great Lakes Chapter of the Undersea Medical Society will hold its annual meeting and film festival on October 12 on the Main Street campus of the State University of New York. Open to the public, the event will feature Dr. Fred Bove and other medical experts, a panel discussion on diving myths, a film festival, CPR refresher course and computerized diving self-test.

Tickets are \$10 for UMS members and \$15 for non-members. For information contact Bill Norfleet, Hyperbaric Research Lab, SUNY at Buffalo, 124 Sherman Hall, Buffalo, NY 14214; (716) 831-2746. 🐠

### CALTECH FILM FESTIVAL

Jim and Cathy Church will present their slide productions, including collections



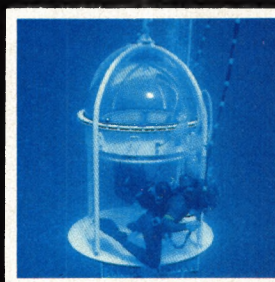
photo/Jim and Cathy Church

on the *Rhone* and *Cartanser Sr.*, at the Caltech Film Festival October 26 in Pasadena, California. The Chuck Nicklin films, *Red Sea* and *Whales Weep Not*, will also be shown.

Sponsored by Caltech Public Events and the Caltech scuba diving club, the



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Photos by LARRY CUSHMAN

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## FILM FESTIVALS

Kelpers, the event will begin at 8:00 pm in Beckman Auditorium, South Michigan Avenue (at Constance Street). Tickets are available at all Ticketron agencies and at the Caltech Ticket Office, 332 S. Michigan Ave., Pasadena. Call (818) 356-4652 for information. ❧

## NEW JERSEY SYMPOSIUM

The New Jersey Council of Diving Clubs will present the ninth annual symposium, Dive New Jersey . . . and Beyond, November 9. The event will be held at Lucy Stone Hall, Rutgers University, Livingston Campus, New Brunswick, New Jersey. Exhibits open at 12:00 pm and the general program is from 1:00-5:00 pm. This year's symposium will include underwater photography and travelogues about local waters as well as more exotic locations.

For information, write Karen Becker, Symposium Chairperson, 254 Hamilton St., New Brunswick, NJ 08901. ❧

## INWARD TO THE SEA

The 14th Annual Inward to the Sea symposium will be held in Washington, D.C., on Saturday, November 9. Daytime seminar topics will include: the use of sport divers in the exploration of Civil War artifacts; sea snakes; the pirate ship *Whidah*; shark-diver interactions; clinical use of the hyperbaric chamber in Baltimore; fish adaption; underwater video; pirates on the Chesapeake; spearfishing without scuba; diving the *San Diego*; and the Divers Alert Network.

The evening film festival will be hosted by Stan Waterman and will feature his latest films.

The daytime program, from 10:00 am to 5:00 pm, is at Building C of George Washington University (on G Street between 22nd and 23rd NW). The film festival begins at 7:30 at the Lisner Auditorium (21st and H). Each event costs \$7. For further information, contact Inward to the Sea, P.O. Box 17502, Washington, DC 20041-0502; (703) 938-5235. ❧

## KAUAI FILM FESTIVAL

The Kauai Underwater Association will host its fourth annual film festival on Kauai November 19. This year's event will be held in conjunction with NAUI Dives Hawaii and the MC will be Dr. Eugenie Clark. Jack McKenney will also be present and his films and those of Stan Waterman and Nick Caloyianis will be featured.

For information contact: Nikolas Konstantinou, c/o Sea Sage Diving Center, 4-1378 Kuhio Highway, Kapaa, Kauai, Hawaii 96746; (808) 822-3841. ❧



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FILM TEST

# PROFESSIONAL EKTACHROME 100

TEXT AND PHOTOGRAPHY  
BY JIM AND CATHY CHURCH

**K**odak's Ektachrome 100 color slide film is now available in a professional version. Designated as EPN 135-36, this latest Ektachrome is an upgraded version of the regular consumer Ektachrome 100 you may already be using.

## WHAT'S DIFFERENT?

The difference between a professional Ektachrome and a consumer Ektachrome can be confusing at first because both films are virtually the same. However, there are important differences in the ISO rating, aging and storage. The professional versions receive special handling.

Because the actual ISO film speed can vary slightly with different batches, and both color balance and film speed change with time and storage temperature, consumer films are shipped from





the factory before they reach their optimum quality. The film manufacturer's problem is estimating how long the film will be stored at room temperature before it is exposed and processed. To illustrate, think of the farmer who ships green fruit that will ripen on the way to the market and on the grocer's shelves.

Kodak Professional Ektachrome EPN eliminates the problems of quality changes caused by time and temperature. EPN is shipped from the factory as it reaches its optimum color balance. Each batch is tested for film speed and the effective ISO rating (to the nearest one-sixth stop) is stamped on the enclosed instruction sheet. Thus, the effective ISO film speed of EPN may be specified as ISO 80, 100 or 125. The only way to be sure of the effective speed is to open the carton and look at the enclosed sheet.

How do you know if the Ektachrome 100 you are using is the professional version? First, look for the words Professional

**Opposite page top: The encrusted wreckage of the *Sankisan*—15mm lens, f/5.6, twin SB-103 strobes at half power with diffusers. Opposite page bottom: Cathy Church poses with twin SB-102 strobes—15mm lens, SB-103 strobe with diffuser.**

### PROFESSIONAL EKTACHROME 100

Format tested.....EPN 135-36  
Suggested retail price.....\$8.80  
Processing required.....Any E-6  
Processing by Kodak.....\$5.85  
Resolving power:  
Test object contrast 1.6:1-50 lines/mm  
1000:1-100 lines/mm  
Color balance ..Daylight/electronic flash  
Optimum storage:  
Unopened: 55°F or lower  
Processed: cool, dark, dry place

al Film on the carton or the film cassette. Second, when you purchase EPN, make sure the dealer takes it from refrigerated storage. Kodak specifies that EPN (and other Kodak professional films) must be stored at 55°F or lower and only sells professional film to dealers with refrigerated storage.

As long as the film is refrigerated or frozen, the optimum color balance and film speed remain virtually unchanged. If, however, the film has been stored at room temperature, it has been changing.

### SHOULD YOU USE EPN?

Your decision to use the professional version rather than the consumer version of Ektachrome 100 depends directly on how much quality control you want. If you choose the consumer version, the ISO

film speed can vary by as much as one-third stop from the rated film speed and color balance may vary slightly from roll to roll. If you choose the professional version, film speed and color balance will vary much less from roll to roll. While the consumer version allows you to take excellent U/W color slides, you may prefer the extra quality control.

### BASIC EPN EXPOSURES

To give you an idea of how much exposure EPN needs (when rated at ISO 100), here are some examples: In about 35 feet of clear water with a smooth surface and overhead sun, the sunlight exposure with a level camera angle would be about f/8 at 1/90 second. With a strobe-to-subject distance of three apparent feet from an average subject, the basic exposure would be about f/11 with a high power strobe, f/8 for a medium power strobe and f/5.6 with a low power strobe. For Nikonos extension tube and close-up lens exposures or for close-ups with housed cameras and 50 or 55mm close-focusing lenses, f/22 is the basic setting.

### STORAGE AND HANDLING

We usually purchase EPN in 20 roll packages of 36 exposure cassettes and freeze them immediately. When leaving for a trip, we place the frozen packages inside plastic bags and pack the film at the last minute. The film will usually still be cool when we reach the dive resort or boat. If the room has a refrigerator, store it there. If not, a week's storage in an air-conditioned room won't cause noticeable changes in the film. If the room is sweltering hot, ask if you can store your film in the resort's refrigerator or freezer.

### TESTING EPN

We took our first test exposures in Hawaii, using 15, 28 and 35mm lenses, a Nikon Close-Up Kit and a 1:1 extension tube. At Molokini Crater, Jim took several shots of Cathy posing with bright yellow lemon butterflyfish. Using both TTL and manual exposure and exposing for a slightly darkened blue water background, he found most of his pictures were sharp and colorful. EPN kept the blue backgrounds blue and reproduced other colors accurately, but some of the lemon butterflies were overexposed. Thus, we learned that (as with most other color slide films) EPN doesn't like overexposure in highlight areas.

Cathy managed to place her 1:1 framer over the head of a tiny eel and took a dozen exposures with a single SB-103 set for TTL. Even when viewed with a top-quality Kodak loupe, the eel is sharp. Having always used slower films for extension tube work, we were pleasantly surprised at the sharpness and color of these slides.

Our second round of test exposures

was taken at Truk Lagoon, mostly with a single Nikon SB-103 with diffuser and manual exposure control. Because the water was somewhat turbid, we wished to minimize the amount of strobe light used to reduce the amount of backscatter from suspended particles in the water. While we succeeded in reducing backscatter, we did lose some of the colors of the flora and fauna on the wrecks.

Because many scenic shots of divers on the encrusted wrecks have details at both near and far distances, Jim appreciated ISO 100. Apertures were usually f/4 or f/5.6 with level camera angles, which gave barely enough depth-of-field with a 15mm lens. If he had used his old standby, EPR (Professional Ektachrome 64), he wouldn't have had enough depth-of-field for many of his shots. In examining the slides, we concluded that while Kodachrome may have produced slightly sharper images with slightly brighter reds and yellows, EPN produced natural colors with better blue backgrounds.

Our final test exposures, taken off Grand Bahama, confirmed that Ektachrome 100 EPN film is less blue and has better reds than Ektachrome 64.


### PROCESSING EPN

We sent some of the exposed EPN to Kodak (Rochester lab) for processing and processed some ourselves. Although Cathy generally prefers the color saturation she achieves with her own processing, Kodak's processing produced brighter yellows. Thus, these slides appeared brighter, snappier and had better blue backgrounds.

EPN does the job that Kodak advertises. Colors are natural, without the bluish tint of the older Ektachrome 64. The shadow areas were a natural blue, reds were excellent, skin tones were natural pink and the images were sharp. Shadow areas have good detail, but our highlight areas lost details with overexposure. If you are photographing subjects with a wide exposure range from the darker to the lighter areas, be sure to expose for the brighter areas. And, if the subject has small, bright highlight areas, or if you are shooting for magazine reproduction, try exposing EPN at ISO 125 rather than 100 and then processing for ISO 100.

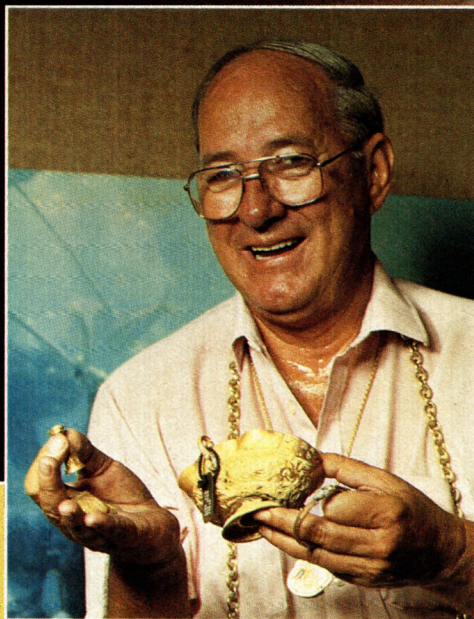
Because EPN is also good for close-ups, you can standardize with it for most of your U/W photography.

Kodak's quality control was excellent. Our EPN exposures—taken at different locations with different water conditions and with different cameras and lenses—were generally uniform. There were no detectable shifts in speed, color or sharpness. Once we learned the film's characteristics, the results were predictable.

For more information, write directly to: Eastman Kodak Company, 343 State Street, Rochester, NY 14650. 



# ATOCHA TREASURE FOUND



photo/Greg Johnston



photo/Dan Kincaid

This priceless "girdle" made of gold links, set with pearls, diamonds, sapphires and rubies, was worn around the neck or waist. Above left: Treasure hunter Mel Fisher holds a golden chalice, six foot money chain, doubloons and other golden trinkets—in all, worth more than \$1 million. Left: These gold bars and emerald jewels were found on Memorial Day weekend, 1985. The bars are worth \$250,000 each.



# Mel Fisher Uncovers World's Greatest Treasure

TEXT AND PHOTOGRAPHY BY STEVE LUCAS

**"T**oday's the day!" Mel Fisher's positive statement has been made religiously everyday for more than 16 years. It had become Treasure Salvors' (his Key West headquarters organization) marching cry as the group searched the lower Florida Keys almost yard-by-yard for the Spanish treasure galleon, *Nuestra Señora de Atocha*. It was a ship with a cargo so valuable, its sinking in a hurricane caused a depression in Europe and almost threw the Spanish court into bankruptcy.

Sailing from Havana on September 4, 1622, its cargo of gold and silver bars and rare art objects was of extreme value. The ship's manifest listed more than 600 pounds of gold, 1,200 silver bars weighing upwards of 70 pounds each and 250,000 silver coins—almost 47 tons of treasure valued at almost \$400 million!

From the very beginning, almost everyone thought Fisher was chasing an impossible dream. Other treasure hunters thought the wreck could not be located, but enough adventuresome capitalists believed Mel, the eternal optimist, could find the *Atocha*—the "Big A." No one was aware of the magnitude of the challenges and adversities that lay ahead. With the find of the first traces of the ship in 1971 began a string of triumphs, legal battles with Florida and the United States government and personal tragedies that sound as though they were written for a television movie.

Fisher's first big treasure find came in the mid 1960s when he and his partners discovered part of the 1715 Spanish Plate Fleet of ten treasure galleons between Vero Beach and Fort Pierce, Florida. After bringing in more than \$2 million in gold and silver, he decided to go after the *Atocha*.

The search began in 1968 and the first real treasure was not recovered for three years. A principal reason for the delay was the difficulty in interpreting some 20,000 pages of original Spanish documents found in the Archives of the Indies in Seville, Spain. These described the ship, its cargo, loss and subsequent recovery efforts.

Working from a reference to Matecumbe in those documents, Fisher began his search 100 miles away from where the actual wreck would later be located. Thinking the reference was to the islands now called Upper and Lower Matecumbe between Marathon and Key Largo, he spent two years in the area finding dozens of wrecks, none of significant worth. Later his historians would learn that Matecumbe was actually the Indian chief who ruled the Florida Keys during the period, not a location.

Other clues to the treasure's location would continue to confuse the search and give up their secrets very slowly. Some would continue to mystify until well after the bulk of the treasure was found.

The Spanish referred in their logs to the *Cabeza de los Martires*, "head of the martyrs." Did that refer to the head of the island chain—Key

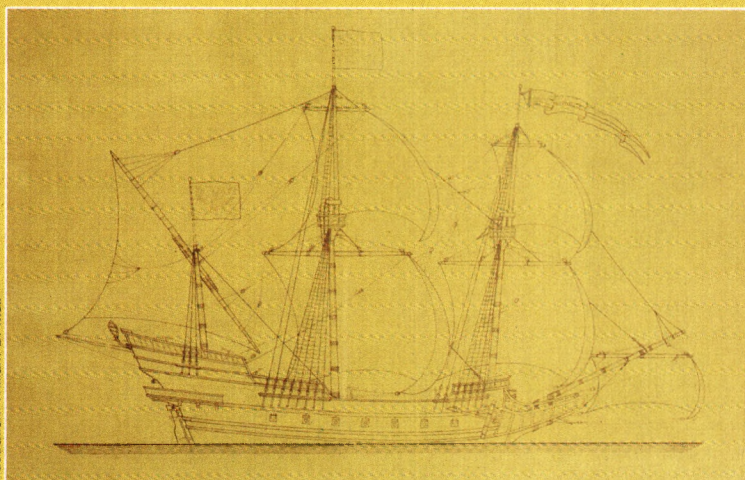


A close-up of a solid gold money chain shows the intricate design of each link. The links could be taken off and used individually or in groups for purchases. An entire chain could buy a ship. Top: Solid silver bars, each weighing more than 70 pounds and worth up to \$40,000, lie stacked on the floor of the Treasure Salvors museum. The dull, oxidized surface and encrustation give little evidence of the valuable metal inside.





A gold money chain and emerald studded cross. The cross is considered priceless.



This drawing of the *Atocha* was created from descriptions in the Archives of the Indies. Ballast piles were the only visible evidence of the wreckage.

Largo or Key West? Translated, *martires* means a place of martyrs or lost souls. To what were the Spanish referring?

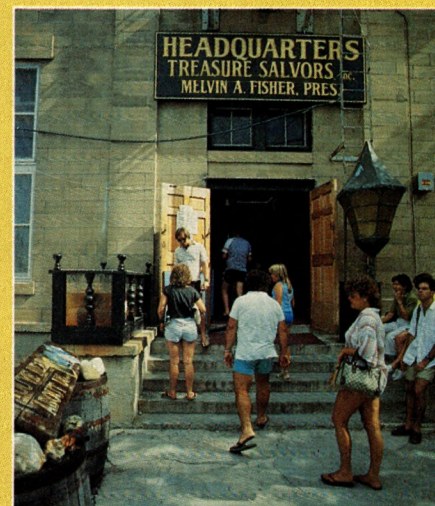
Another mystery concerned a cartoon-like map drawn by one of the *Atocha*'s five survivors. Florida was shown with tiny palm trees on its shores. People were shown in caricature, floundering in the waves. Three islands were shown east of the wreck site at a point where there was only one major island. Everything seemed out of place. Could this be an accurate wreck map or only the scribbles of a person confused by a hurricane?

In 1970 Dr. Eugene Lyon, chief historical researcher for Treasure Salvors, made a very important discovery in the archives. He found an expense report for salvage efforts on the *Santa Margarita*, a sister ship to the *Atocha*, which sank at the same time. It made definite references to the *Cayos del Marquez*. Fisher immediately moved his search to the Marquesas Islands, west of Key West.

Later, when staff photographer Don Kincaid flew over the islands to take aerial photos, he saw the answer to the reference to the martyrs. From the air, or from the mast of a tall ship, the Marquesas look like a skull, the head of the martyrs. One of the mysteries had been solved, but where was the bulk of the treasure?

In June 1971 an enormous galleon anchor was discovered under the sand.

**Treasure Salvors Key West office. Bottom: Solid gold plate from the *Margarita*.**





When Kincaid went down to photograph it he stumbled upon an eight and one-half foot long solid gold chain. Silver coins, gold bars, more gold chains and several matchlock muskets were soon recovered. The coins were all minted prior to 1622. No one knew whether it was the *Atocha*, the *Margarita* or another wreck.

The joy over this major find was short lived. It would be two years before Fisher's divers found any substantial amount of treasure. Then, Fisher's son Dirk discovered three silver bars and a ship's anchor in shallow water in an area called the Quicksands. Soon, more chains, gold bars, valuable artifacts and silver bars were discovered. Dr. Lyon began to work from the official Spanish markings on the bars. He determined they were listed on only one ship's manifest. Mel Fisher had found the *Atocha*.

Tragedy and legal battles were close behind the excitement of the discovery. In 1975, shortly after Dirk, then 21, discovered a bronze cannon that was undoubtedly the *Atocha's*, he, his wife Angel and diver Rick Gage died when their salvage vessel capsized and sank.

Then, when several hundred thousand dollars of treasure deposited in the Florida state archives, as then required by law, "mysteriously" disappeared, Fisher decided to challenge the state's claim to one-fourth of everything found. He

squarely defeated Florida in court. Judge William O. Mehrrens said, "The finding of a great treasure from the days of the Spanish Main is not the cherished dream of only the United States and Florida citizens; countless people from other lands have shared such thoughts. It would amaze and surprise most citizens of this country [to find] when their dream, at the greatest of costs, was realized, that agents of respective governments would, on the most flimsy grounds, lay claim to the treasure."

But the fight was not over. Soon the United States government stepped in and claimed, again under thinly veiled legal premises, 100 percent of the *Atocha's* treasure. The battle went all the way to the Supreme Court of the United States where, in 1982, the justices concluded that no one but Fisher owned the treasure. The *Atocha* was his.

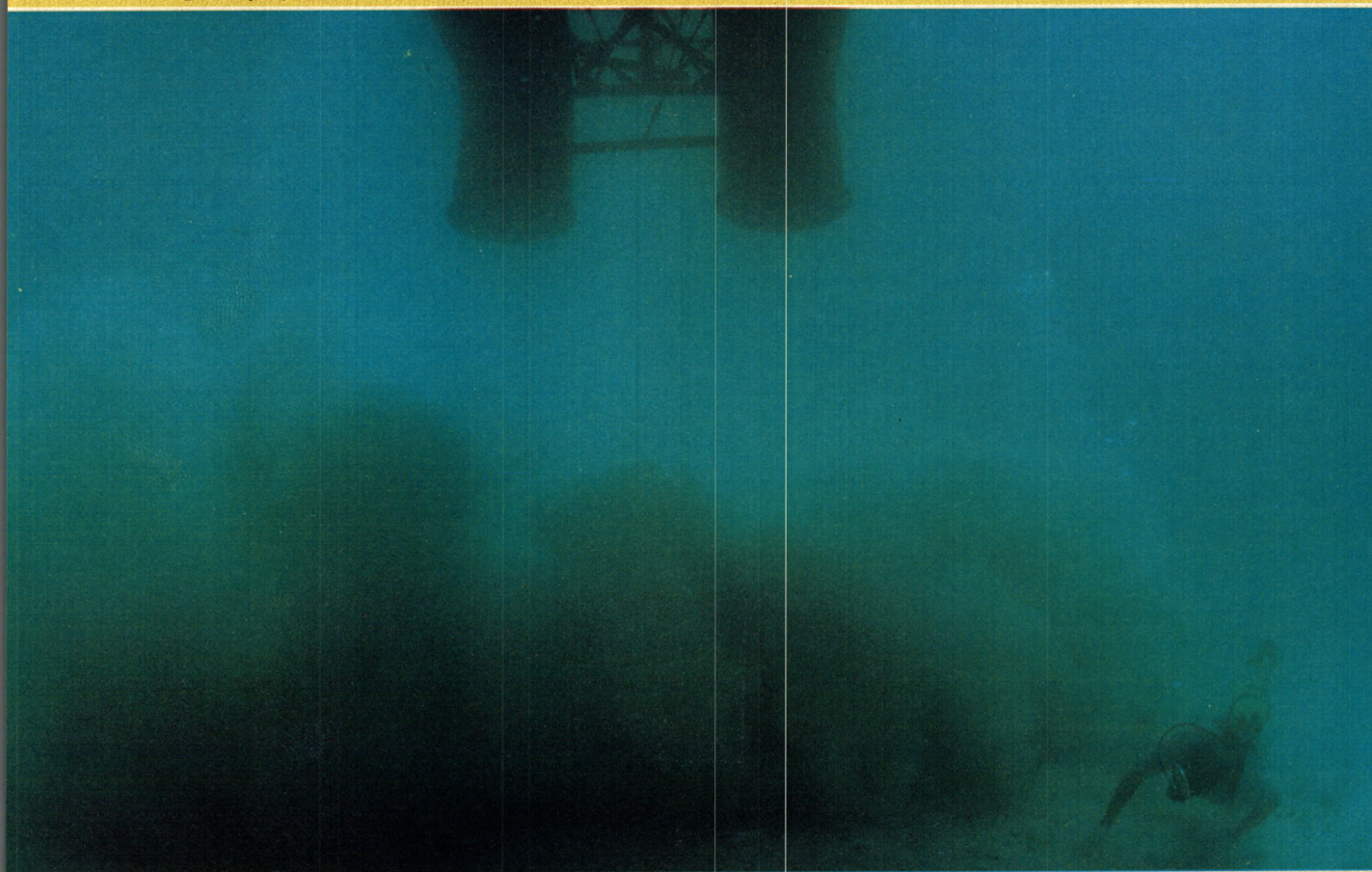
As the search progressed many valuable—some priceless—objects were found, almost one at a time. On July 18, 1982 a diver surfaced with a blackened and encrusted object. Obviously silver, it was heavy and immediately assumed to contain something of great value. Although it was policy to open valuable objects only in the lab, the captain decided to see what the "box" contained. After two hours the most significant piece ever recovered from the *Atocha* sparkled in

the sunlight. A magnificent gold cross, perfectly intact, it was studded with enormous emeralds. It had been on the ocean floor for more than three and one-half centuries. Shown in the Treasure Salvors Museum, the piece is priceless, the emeralds alone worth more than \$1 million.

The search dragged on. Bits and pieces of the wreck's treasure were found over an area six and one-half miles long. The trail seemed to lead toward the main pile and then would vanish entirely. On May 27 and 28 of this year the team members were sure they were within striking range. Thirteen gold bars, a seven foot gold chain and 16 emeralds set in gold were uncovered. Then, nothing. For six weeks the salvage ship *Dauntless* came up empty. It seemed the *Atocha* had fooled them once more.

On a July Saturday morning Fisher came into the office and once more said, "Today's the Day!" Little did he know. Forty-one miles west of Key West in what divers described as an "underwater desert," Andy Matroci and Greg Wareham swam to 55 feet to check out a strong electronic reading. They saw ballast stones, then some silver coins and then their underwater metal detector screamed. A reef of solid silver bars, looking exactly the way a diver would imagine, lay stacked all over the seafloor. They had found the "mother lode."

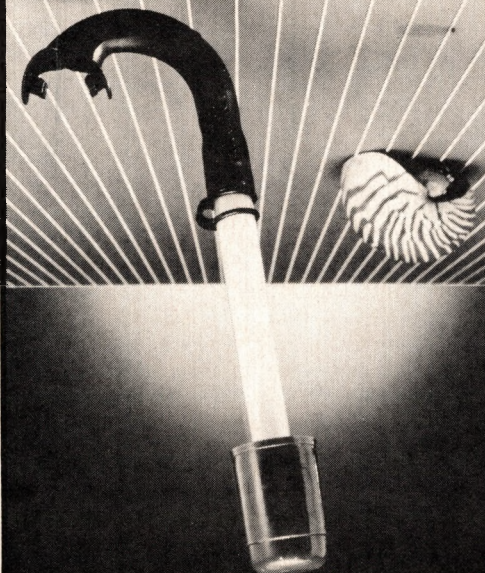
**Deflectors guide propwash to the ocean bottom to blow away sand and sediment and, thus, uncover deeply buried items.**



photo/Don Kincaid



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**ATOCHA**

Describing the site, the first divers on the scene laughed out loud. "It was the world's most expensive lobster condo," one said. "Monofilament fishing line was all over the place," said Don Kincaid. People had been fishing on this spot for years thinking it was a reef! It was—a reef of gold and silver bars, coins, chains, rubies, diamonds, pearls and emeralds worth almost \$400 million!

In the first week, the crew recovered nearly 500 silver bars, each weighing 70 pounds. Eight treasure chests, very similar to those you would visualize, some complete with hinges, were located. Made of mahogany, "they look more like cardboard than wood," Kincaid said. Seven contained up to 2,000 pieces of silver. Each chest's treasure was worth about \$2 million. The eighth was filled with solid gold bars.

The bulk of the treasure will take up to two and one-half years to recover. The reason, according to Duncan Mathewson III, Treasure Salvors' chief archaeologist, is the care with which everything is removed. Shortly after the site was located archaeological grids were placed on the scene. Everything is logged as it comes up, with care made to note exactly where in the grid pattern every single item is found. "A cross between a scientific investigation and a treasure hunt," he called it. Enough material will be recovered as quickly as possible to satisfy the investors in the project, but the bulk of the recovery will be done slowly so the data can be studied.

When the main pile was found, one of the divers remembered the old cartoon map. He raced to the top of one of the recovery ship's masts and looked at the horizon. For years they had been reading the map incorrectly. It was drawn from the perspective of a sailor on the top of a tall ship's mast. Turned on edge, everything fell into perspective. From that distance, instead of one large island, the Marquesas appeared to be three small islands! The map had been correct.

When asked if immense wealth had changed Mel Fisher, Bleth McHaley, one of Treasure Salvors vice presidents and a former staff member of SKIN DIVER in its fledgling days, said, "Never! It's not the money he's after, it's the search." Less than a week after the *Atocha* was found Fisher was already talking to investors about the next wreck.

When the *Atocha* find came, Kane, Fisher's youngest son and captain of the *Dauntless*, immediately radioed Treasure Salvors' base. "Put away the charts," he yelled. "I've found it!" Pandemonium broke out all over Key West.

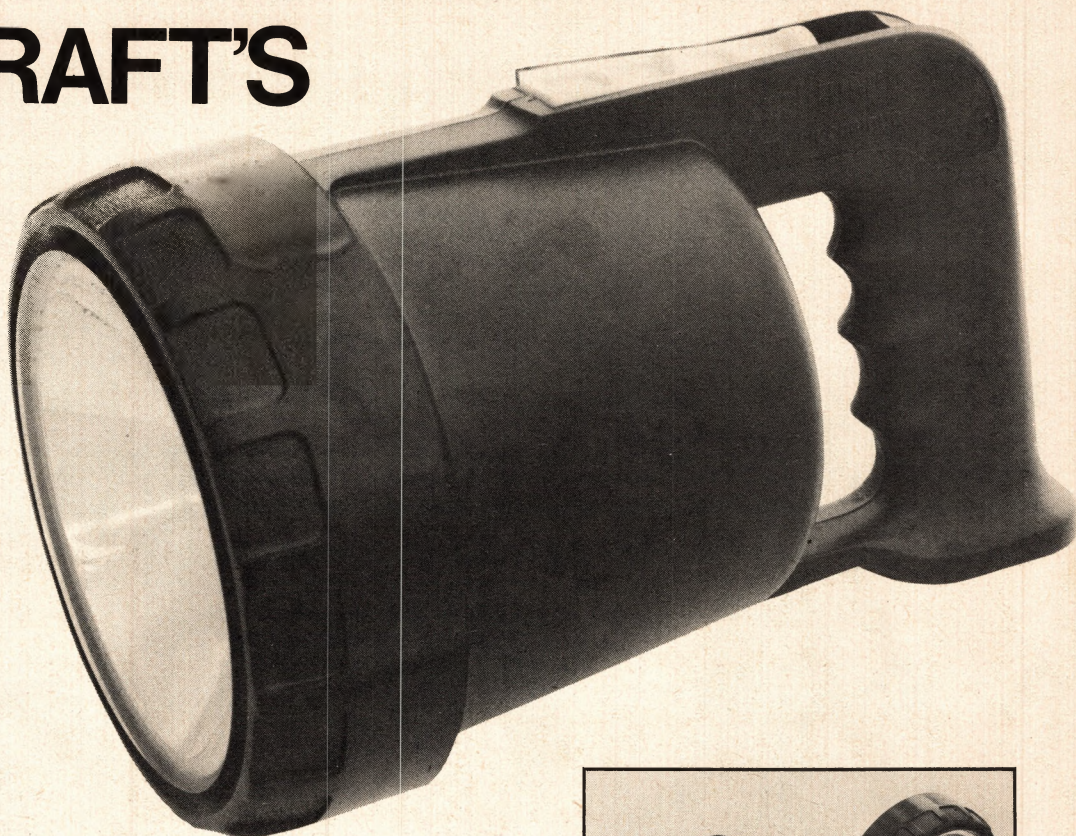
For Mel Fisher and the *Atocha*, Saturday, July 20, 1985, really was the day!



# AQUACRAFT'S

## Vega Light

TEXT AND PHOTOGRAPHY  
BY GEORGE COZENS



**A**quacraft II's Vega is a medium sized, mid-priced underwater dive light with some very desirable features.

It appears ruggedly built and is guaranteed to a depth of 400 feet. Durable plastic is used in all the major components. The front cap, consisting of the bezel, lens and reflector, screws onto the case and seals with a large, compressed O-ring. The latter is easily accessible for inspection, cleaning and regreasing. Basically, the case is cylindrical, except for the integrally molded handle at the rear. The pistol-grip form of the handle and its rear position allow for comfortable handling and for aiming the light beam forward without undue wrist strain. In addition, the sealed magnetic switch and the focus adjustment—more about this later—can be conveniently reached with the same hand holding the light. The sliding switch bar, in the top of the handle, is secured in the on and off positions by means of indents at each end of its travel.

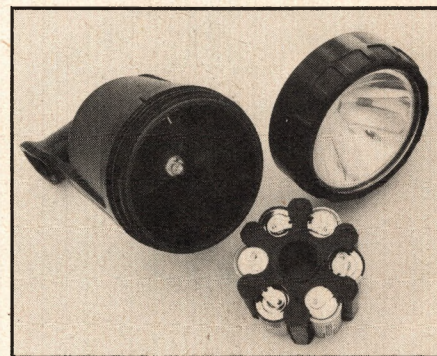
Power is supplied by six D cells. Alkalines are recommended for better performance. These fit snugly into a compact, plastic battery holder. Connections among cells are made with stainless steel strips; most other electrical connections are made with chrome plated brass.

The light bulb is a type PR-18. These are inexpensive, small and available almost anywhere. Several of these bulbs can be carried in a spare parts kit to guard against loss of dive time owing to

a burned out or broken bulb. The combination of a PR-18 bulb powered by six alkaline D cells should give close to seven hours of burn time—longer, perhaps, if the light is used only intermittently. It would still be wise, however, to carry extra batteries. Like the small bulb, spare batteries for this light are relatively inexpensive and take up very little space.

Light output of the Vega is both intense and wide—but not necessarily at the same time. This brings us to the most significant feature of the light: The intensity and width of the beam can be adjusted by the diver, underwater! By merely rotating the serrated knob just forward of the handle, the position of the light bulb can be changed within the reflector, making the light beam wider and less bright, or narrower and more intense. And remember, this focusing knob can be adjusted by the same hand holding the light. A simple movement of one finger modifies the beam from illuminating a relatively large area to concentrating on a small area of interest. With some typical, fixed-focus lights, the optimum beam intensity may occur at only one distance. Moving toward or away from the subject causes the beam to spread and the intensity to decrease. This isn't a problem with the Vega. To achieve the optimum intensity at any given distance, readjust the focus.


In the water this light is a little buoyant. It floats beam-up on the surface, making it easier to spot should it be lost. Divers



**The Vega is powered by six alkaline D cells. The magnetic switch can be operated by the hand holding the pistol grip.**

wishing to make the light negative can place a piece of lead in the hollow cavity of the handle or in the space between the reflector and battery holder inside the case. (Be careful not to short out any of the electrical contacts.)

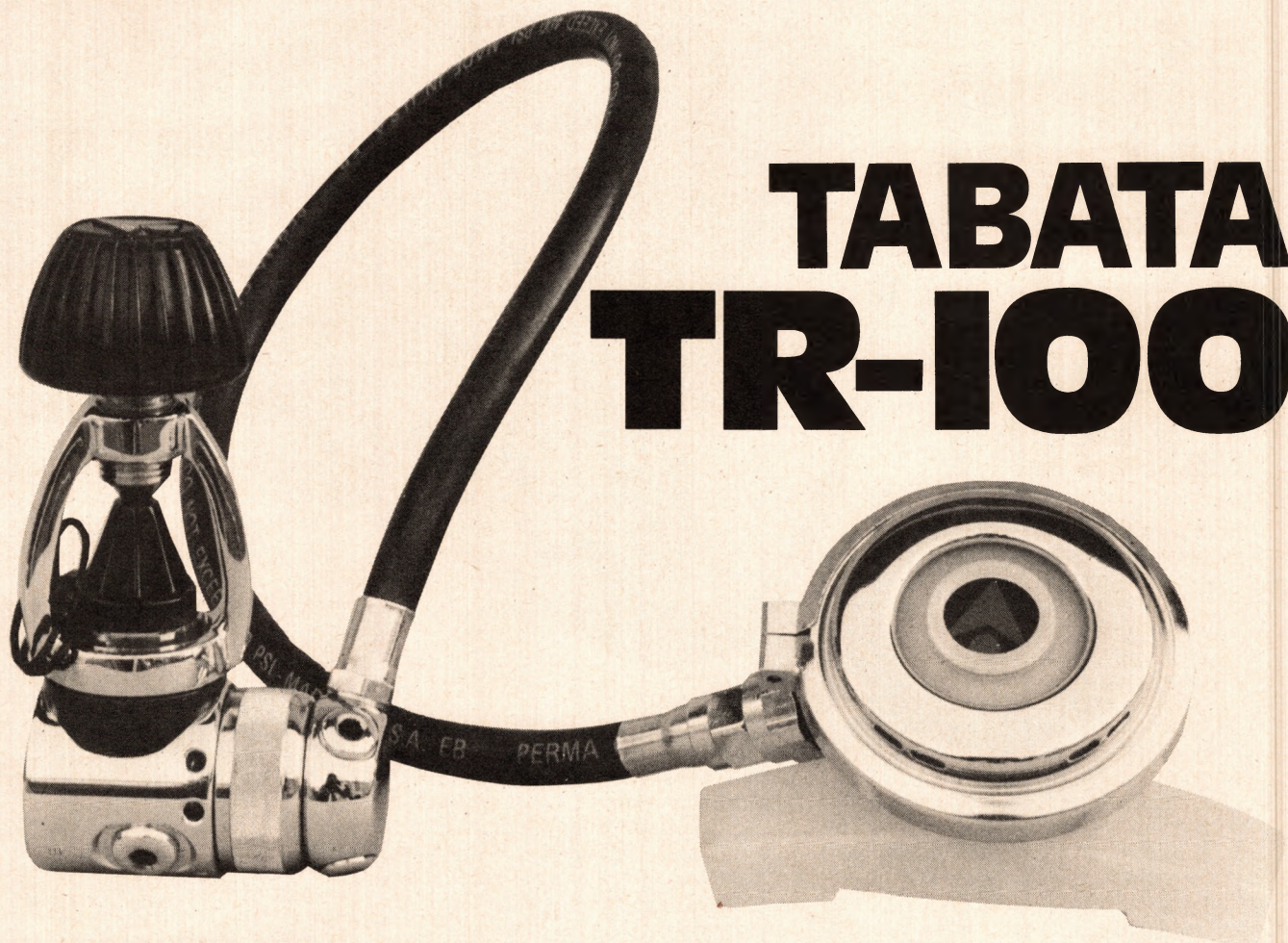
Changing light bulbs and batteries is very simple. Routine maintenance is equally easy: Rinse in fresh water after use, occasionally cleaning and lubricating the main and focusing control O-rings. If the light should leak, disassemble it, rinse in fresh water and dry—preferably, with compressed air. The corrosion resistant materials used in the light should not be harmed. Inspection of the seals, bulb and batteries would, of course, be in order.

Aquacraft's Vega dive light has a suggested retail price of \$69.95. If it appears to meet your needs, give it some serious consideration. It can add brilliance to your diving adventures. 



## SDM SPECIAL SERIES ON REGULATORS

TR100



# TABATA TR-100

BY ERIC HANAUER

PHOTOGRAPHY BY BONNIE J. CARDONE

**W**hen Japanese firms such as Honda and Mazda built factories in the United States to manufacture their cars, that was news. But Tabata was here first. For several years, its regulators have been as American as hot dogs, mom's apple pie and the Chicago Cubs. Tabata had decided its domestic regulator wasn't right for the American market, so it contracted with a Torrance, California, firm to produce one. The new regulator is not only manufactured but also designed and engineered right here in the USA.

Although the new TR-100 bears a resemblance to Tabata's earlier TR-30, it is the result of considerable refinement and improvement. It was developed over a period of 12 years. One of its major improvements is the more compact first stage. This responds to diver demand more quickly, especially when tank pressure is low. There are added safety features in the event of an overpressure con-

dition. The TR-100 second stage comes in a variety of colors, either translucent or opaque. Most rubber parts are now made of silicone. The TR-100 is lighter and has been modified to produce minimum friction among moving parts.

At first glance, the most obvious feature of the TR-100 is the colorful second stage housing. It is available in a veritable rainbow of colors to coordinate with Tabata's mask frames, snorkels, fins and BC jackets. Although company spokesmen prefer to talk about the regulator's high-tech engineering, they admit color selection is a major sales factor. There are eight colors available including pink, yellow, lime, orange, aqua blue, transparent rose and transparent royal blue. Traditionalists can even order basic black.

Beyond cosmetics, the TR-100 has been significantly changed inside. Breathing response has been improved by minimizing friction and weight has

### TR-100

Total weight.....Approx. 1½ pounds  
First stage:

Type .....Balanced piston  
Working pressure.....4,000 psi  
Material .....Forged brass  
chrome plated

High pressure ports .....2-7/16"  
thread, on swivel cap

Low pressure ports .....4-3/8" thread

Freezing protection.....Standard

Intermediate pressure .....130 psi

Length of hose . . . 27" (33" for octopus)  
Swivel connection.....On first  
and second stage

#### Second stage:

Type .....Downstream, lever action

Airflow capacity .....47 cu. ft./min.

Material.....Plastic body, Silicone dia-  
phragm, mouthpiece, exhaust tee

Exhalation port .....One, with  
silicone valve

List price .....Regulator \$200  
Octopus \$94



been reduced by greater use of plastics. The second stage housing, of high grade ABS, has cleaner, more precise tooling. The demand valve sleeve is now made of Delrin and is sonically welded to the second stage case. Delrin is a low friction, high density plastic that provides a self-lubricating shaft area for the poppet. This helps eliminate the possibility of freeze-up caused by buildup of salt and mineral deposits. The old brass valve sleeve was heavier and had a metal-to-metal shaft-poppet connection. Another friction reducing device is a nylon button attached to the downstream lever, which rests against the stainless steel disc mounted on the diaphragm.

All rubber parts have been replaced with translucent white silicone, which wears longer and looks better. This includes the diaphragm, exhaust tee, exhaust valve, mouthpiece and diaphragm cover. The exhaust tee is attached by T-fasteners, so it can't pop off accidentally.

The first stage is a balanced flow-through piston design. It is one-half inch shorter than the first stage of the TR-30. A significant change in airflow passages has eliminated 90 and 45 degree bends, along with a reduction of orifice size in the high pressure flow. The passage is now shorter and more direct, resulting in more immediate response, especially when tank pressure is low.

The larger high pressure seat is now made of Teflon instead of polypropylene for more strength. In case of overpressure, an orifice will release air through the high pressure seat. This prevents extrusion of the high pressure seat, which could shut off the diver's air supply. Lack of this safety feature has resulted in recall of some other manufacturers' regulators.

Environmental protection is built into the first stage by means of seven small-orifice ambient ports. Silicone grease injected into the ports protects the spring and diaphragm from direct contact with waterborne contaminants. Some manufacturers offer no environmental protection; some sell it as an optional extra. It is standard on the TR-100. Two high pressure ports allow the diver to mount the regulator vertically or horizontally and also to position the submersible pressure gauge on either side. Four low pressure ports are mounted on a swivel cap to further allow customizing the position of regulator-mounted accessories. The cap turns hard when the regulator is not pressurized, but when the air is turned on the piston floats, allowing the cap and the attached hoses to swivel freely.

Annual inspection and service is required to keep the factory lifetime warranty in force. This usually consists of re-

placement of the poppet and the high pressure seat, along with worn O-rings. The entire first stage is designed for easy maintenance and repair. For example, an experienced technician can replace the high pressure seat in 30 seconds.

For our test of the TR-100, we boarded the dive boat *Truth* in Santa Barbara for a trip to San Miguel Island. It was a bright, sunny day; the water was flat and clear as we anchored at Wilson Rock, an underwater pinnacle that is one of the prime dive locations of California's Channel Islands. This presented a serious conflict for me. Should I do my job and test the regulator or have fun on a prime diving spot, which I might not get to see again for a long time?

Fun won out over the work ethic for the first dive of the day. Conditions were so good the *Truth* remained anchored at Wilson for a second dive. That gave me a chance to perform the deep part of the test. After the *Truth* moved in closer to Miguel, I was able to do serious testing on the remaining two dives.


The TR-100 lived up to its high performance billing. At 100 feet, it delivered air easily during hard swimming and heavy breathing. When I gently sipped air, it flowed easily with no effort required in any position except on my back. All single hose regulators require more effort in that position.

While descending head first, I noticed a slight flow of air. This prevented water leakage, which occurs on many regulators when upside down. I could get the TR-100 to leak only when on my back, with my head extended far backward. Since few divers ever assume this position, this is no cause for concern. The TR-100 breathes slightly damp, delivering a fine, almost imperceptible mist with the incoming air. Many divers prefer this to a totally dry regulator, which can cause a feeling of "cotton mouth."

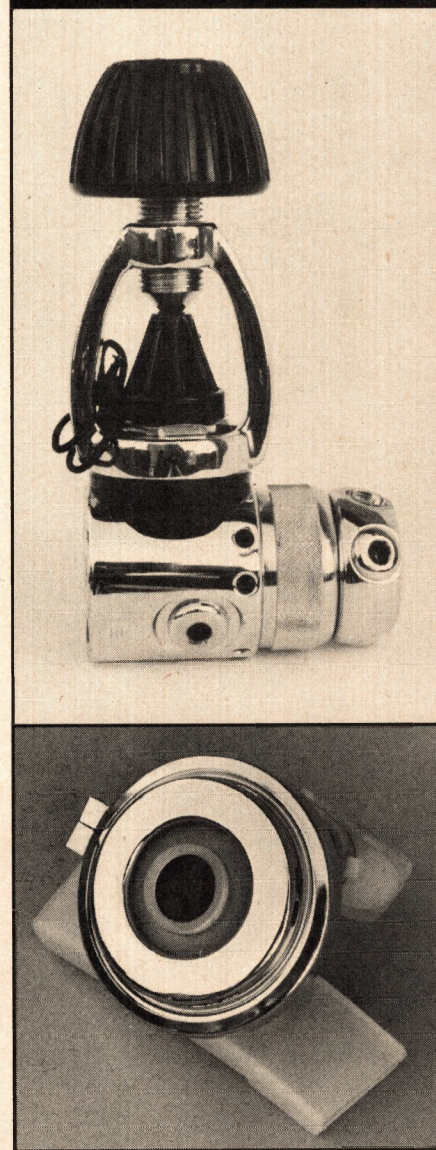
Clearing the second stage was extremely easy. A slight puff did the job, with no residual droplets left. Pressing the purge button resulted in a powerful blast of air, which also cleared it completely. When I removed it with the mouthpiece up, the regulator freeflowed until dropped to a vertical position. The mouthpiece should be turned down upon removal to avoid this.

Breathing was smooth and effortless, even with less than 300 pounds of air left in the tank. The only idiosyncrasy noted was a slight groaning noise at the end of a long, slow, drawn-out inhalation.

Tabata feels it is unnecessary to sell anything less than the top of the line, so they offer only the TR-100 in the United States. It is a non-temperamental, high

performance unit of traditional design and up-to-date materials. Although the basic hardware has been around for a while, it has been refined to reflect current practice in the field. Fashion-conscious divers can even match the color of the second stage to the rest of their equipment. Backed with a lifetime warranty, the TR-100 sells for \$200; an octopus second stage with a 33 inch hose is available for an additional \$94. For further information, see your Tabata dealer or contact the manufacturer, Tabata USA Inc., 2380 Mira Mar Avenue, Long Beach, CA 90815. 

**The TR-100 first stage (top) offers two high pressure ports and four low pressure ports on a swivel cap. All second stage rubber parts have been replaced with translucent silicone.**





# DACOR'S 63



50 cu. ft.



63 cu. ft.



80 cu. ft.

photo/courtesy Dacor

## A Technological Milestone in Scuba Tank Design

TEXT AND PHOTOGRAPHY BY GERI MURPHY

**D**acor has a new tank size. That is correct, they have an entirely new size of tank, different than all other tanks currently available. It is a 63 cubic foot aluminum cylinder. In size, it is midway between the aluminum 50s and 80s. It holds 27 percent more air than the 50, has better buoyancy characteristics than the 80 and is four inches shorter than the 80.

The new size was arrived at after Dacor's Research and Engineering Department spent a lot of time studying scuba classes and diver training. First the researchers studied the air consumption ratio between men and women. It is well known that women require less air underwater than men. However, aluminum 50s

left women short of air when matched with men wearing 80s. A more realistic match was found in the ratio of air contained in 63s and 80s.

In observing scuba classes, Dacor's researchers also found a definite need for a shorter scuba tank. This would allow students to sit comfortably at the edge of a training pool or dive boat and eliminate the annoyance of the tank riding up high on the back. Again, the 63 met these needs perfectly and still offered plenty of air for training dives.

Although the 63 cubic foot tank was originally designed for experienced women divers and scuba students, it has a widespread appeal. Yes, men are buying

just as many 63s as women. The new size is more compact, lighter and still has sufficient air for most sport divers.

Dacor's new 63 cubic foot tank possesses all of the features of a modern scuba tank. Manufactured by Luxfer, the cylinder is spun of a high grade T6 aluminum. It is D.O.T. tested and certified for an operating pressure of 3,000 psi.

Like all of Dacor's aluminum tanks, the 63 has a flat bottom for maximum stability. It is available in two basic colors—bright yellow or steel blue.

The 63 can be purchased with one of two different Dacor valves. The SK is a standard non-reserve; the SR is a reserve type. Both are specifically designed to



safely handle operating pressures of 3,000 psi. One feature of the Dacor valve that is especially neat is the on/off valve knob. While most knobs stick out at a 90 degree angle, the Dacor model is set at 107 degrees, thus creating a slight slope and less chance of hang-ups.

The 63 cubic foot tank comes with a 10 year warranty, clearly detailed in the Dacor catalog and the literature contained in the shipping box.

#### OPEN WATER TEST

I had an opportunity to test dive the 63 cubic foot tank while photographing the wreck of the *Mercedes* / off Ft. Lauderdale, FL. I was impressed to find these tanks already available for rental in stores

such as Pro Dive of Pompano Beach.

In gearing up for the dive, I found the 63 exactly as the Dacor engineers predicted. I am 5'4" and I found the 63 much more comfortable than larger tanks. It was easier to sit down while wearing one, particularly on a rocking boat.


Underwater, there was a current blowing at 1.5 knots and I was thankful for the reduced bulk of a smaller tank. My dive on the shipwreck ranged from 60 to 95 feet in depth, providing the opportunity to check buoyancy in a variety of situations.

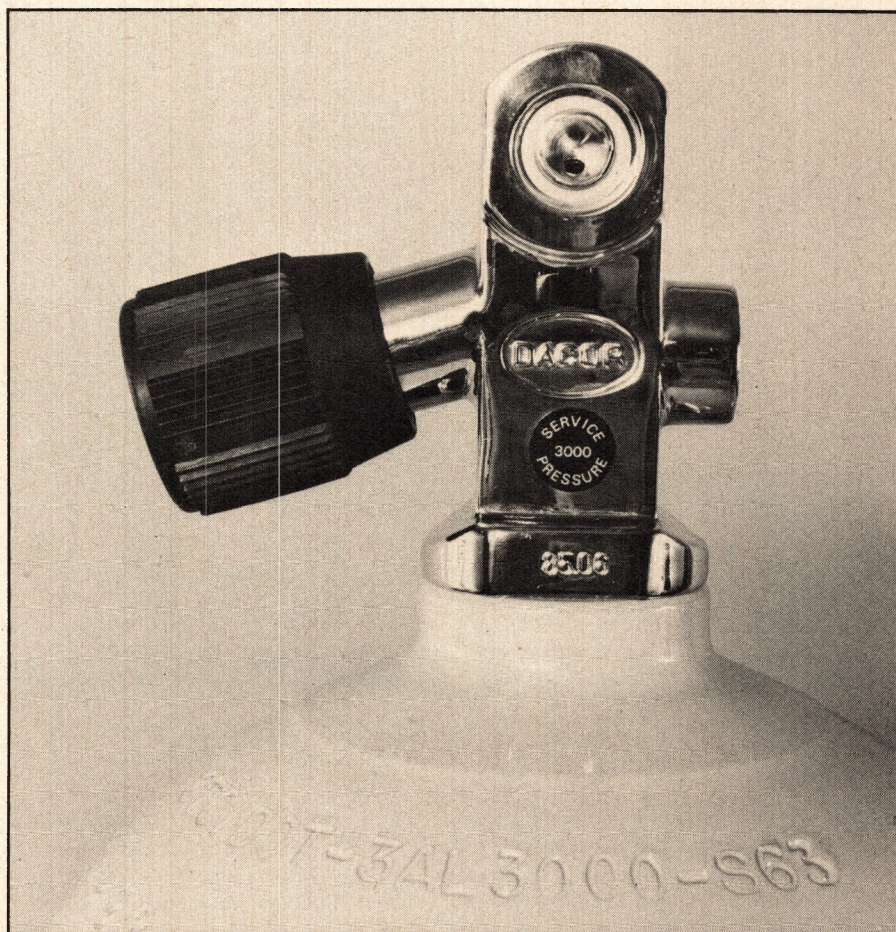
There is no question about it, the buoyancy of the 63 is much easier to compensate for than an 80. At the beginning of the dive, it was 3.04 pounds negative. At the end of the dive, the almost empty tank

was approximately 1.5 pounds positive. This minor shift can easily be controlled with breathing.

In addition to buoyancy characteristics, the little 63 seemed better balanced for underwater swimming. Maybe it is the length of the cylinder that helped.

My underwater experiences with the new tank rated high marks. I would certainly choose a 63 rental tank whenever one was available. The 63 sells for a suggested retail price of \$236, approximately \$10 less than the 80.

For more information about the new 63 see your local dive store dealer or contact Dacor Corporation, 161 Northfield Rd., Northfield, IL 60093; telephone (312) 446-9555. 

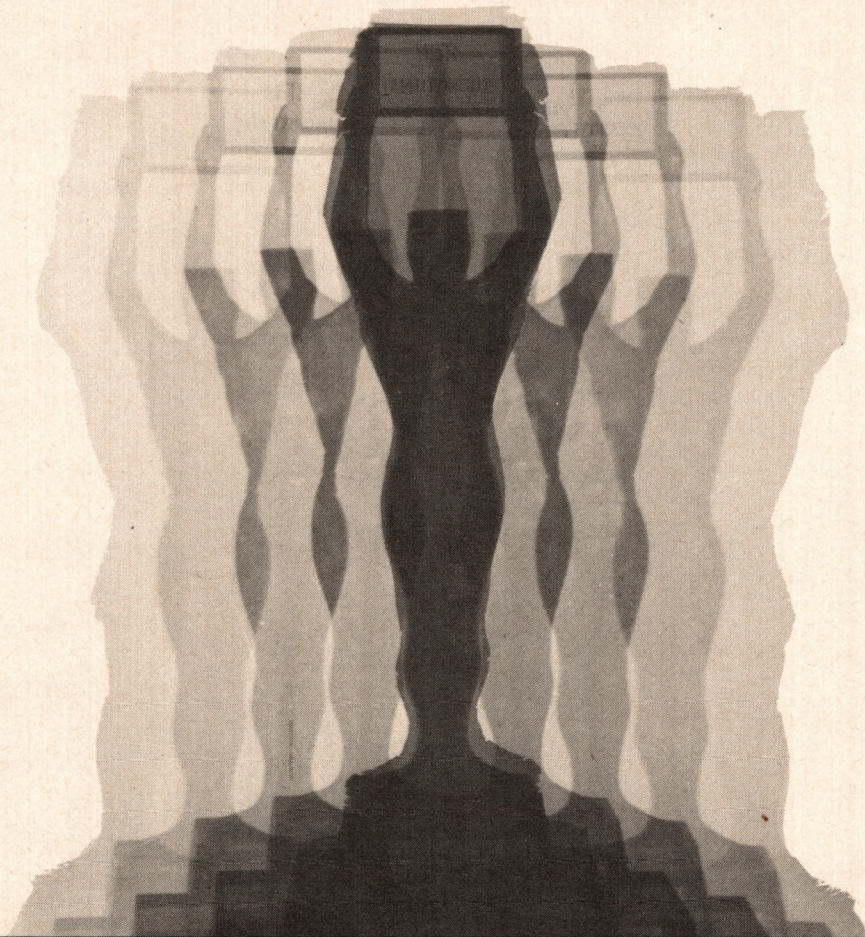


Midway between the 50 and 80 in size (opposite page, top), Dacor's 63 cubic foot model is perfect for the diver who needs a little more air than the 50 offers, but doesn't want the bulk and weight of the 80. Manufactured by Luxfer, the tank is made of high grade T6 aluminum compound and is D.O.T. certified for a service pressure of 3,000 psi. It is available in yellow or steel blue, with a non-reserve (above) or reserve valve, angled slightly to reduce the chance of snagging U/W.

#### DACOR ALUMINUM TANKS

SIZE	PSI	LENGTH	DIAMETER	WEIGHT	BUOYANCY	
					FULL	EMPTY
80 cu. ft.	3,000 psi	29.25 in.	7.25 in.	32.7 lbs.	-1.75 lbs.	+4.06 lbs.
63 cu. ft.	3,000 psi	25.10 in.	7.25 in.	27.9 lbs.	-3.04 lbs.	+1.69 lbs.
50 cu. ft.	3,000 psi	22.25 in.	6.90 in.	22.5 lbs.	-2.60 lbs.	+1.04 lbs.





# 1985 NOGI AWARDS

BY JIM WALKER

**E**very year the Underwater Society of America presents its prestigious NOGI awards to four members of the diving community who have made significant contributions to our sport. The 1985 recipients are: Nancy Sefton/Arts, Gene Shinn/Science, J. Morgan Wells/Sports/Education and Ralph Osterhout/Distinguished Service.

**Nancy Sefton/Arts:** A Cayman Islands resident for 15 years, Nancy Sefton has been an active photojournalist since 1973. She has had four books on marine life/sport diving published, and a fifth will be available soon. She has been widely published in magazines, including SKIN

DIVER, Sea Frontiers, Oceans, Diver and others. She authored a 52 week series for the Cayman Islands entitled Our National Heritage and a 39 week series focusing on marine life. Her photographs have appeared in magazines, newspapers, textbooks and encyclopedias. In 1978-79 the Cayman Islands featured 12 of her photos on its fish series stamps. In 1972 she began a slide/lecture series that has been presented regularly in the U.S. and Cayman.

Through her writings and photography Sefton has facilitated the growth of sport diving by emphasizing the beauty, excitement and mystery of the underwater

world. One of her greatest accomplishments has been in founding and serving as past president of the Cayman Islands Conservation Association—dedicated to coral reef conservation.

**Eugene Shinn/Science:** When Eugene (Gene) Shinn began diving in 1949, he made his first pair of fins from a truck inner tube and his regulator from part of a fire extinguisher. Later, he competed as part of a three man team that dominated competitive spearfishing for several years, winning several individual championships at the same time.

In 1958 he began a career as a limestone geologist with Shell Oil and trav-

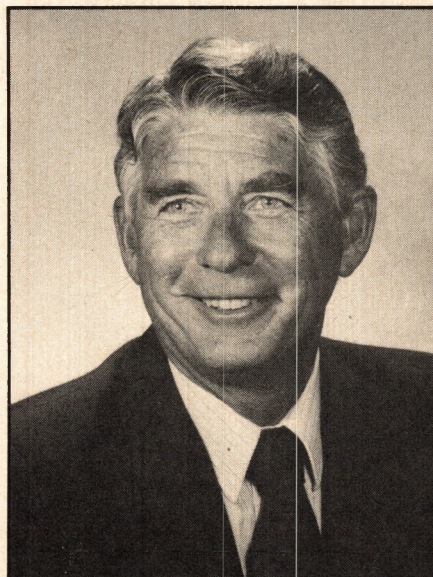
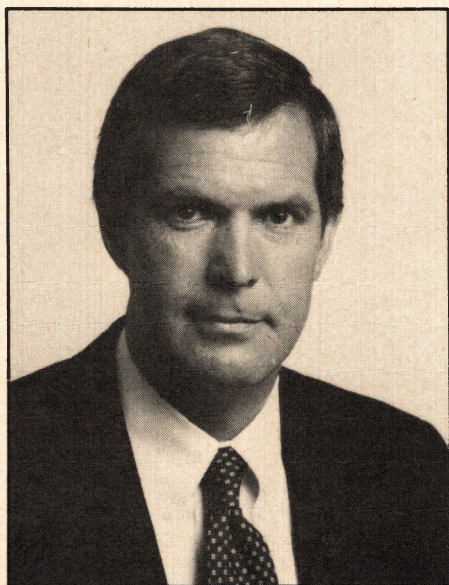


eled the world doing research, publishing scientific papers and making films.

In 1970 Shinn moved into Shell's head office and began coordinating with environmental groups. During this period he became president of the Houston Underwater Club and worked briefly on *Calypso*, helping to produce a special on Bahamian blue holes. He also collaborated on two underwater films, *Steel Reefs* and *Underwater Oasis*.

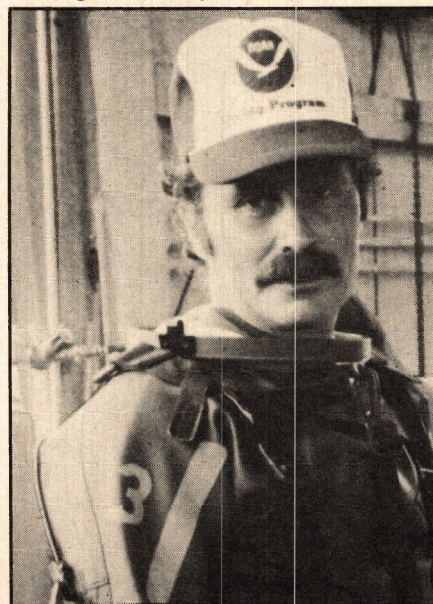
In 1974 Shinn joined the U.S. Geological Survey. Most recently, he studied the geology of the hydrogen bomb craters at Enewetak Atoll. He is currently an adjunct professor at the University of Miami and is a coordinator for the Our World-Underwater scholarship program.

**J. Morgan Wells/Sports/Education:**



**Eugene Shinn/Science**

**J. Morgan Wells/Sports/Education**



**Ralph Osterhout/Distinguished Service**

Dr. Morgan Wells is currently the director of the National Oceanic and Atmospheric Administration (NOAA) diving program in Rockville, Maryland and, for the past nine years, has contributed greatly to the safety of sport diving by educating physicians. He organized and serves as course director for the annual Undersea Medical Society/NOAA Physicians Training Course in Diving Medicine held on Virginia Key. With extensive experience in mixed gas and scientific diving, his duties at NOAA include prevention of diving accidents and investigation of those that occur. He chairs the NOAA Diving Safety Board and has been a major con-

tributor to the *NOAA Diving Manual*.

Wells has lived in seven underwater habitats (more than 175 days total) and his diving expeditions have taken him around the world. He is the author of more than 20 scientific publications and course director for NOAA recompression chamber operations courses.


**Ralph Osterhout/Distinguished**

**Service:** Ralph Osterhout, president of Tekna, is an extremely prolific and dedicated designer of diving equipment. His company offers a host of products from digital instruments to diver propulsion vehicles—all designed to improve the quality and safety of sport diving. However, sport divers owe a much greater debt to him: He has been a major force in protecting the sport from excessive govern-



**Nancy Sefton/Arts**

ment legislation.

Known for his expertise and ability to communicate clearly, Osterhout was chosen by the Diving Equipment Manufacturers Association, in 1974, to represent the industry in its attempt to repeal Los Angeles County legislation that threatened to severely restrict sport diving. The success of this repeal effort is owing, in large part, to his efforts. In 1976 he was again called on by the diving industry—this time to attempt to repeal OSHA's standards restricting sport diving. The arguments presented by Osterhout and his hand-picked team convinced OSHA that our sport could effectively regulate itself. 





photos/Bonnie J. Cardone

**T**here's one blank on each page of my dive log that always gives me trouble. I can fill in depth, time, location, buddy, site description, weather, swells, etc., but I always have to guess at the air and water temperature. And, while water temperature is more often used in post dive exaggeration ("I spent 40 minutes at 50°F with just a one-eighth inch wetsuit—and never got cold!") than anything else, it's still nice to know. If you've dived a site many times, the temperature data in your logbook can give you a general idea of when you may or may not want to visit that site again or what to wear suit-wise if you do.

# CASIO TS-1200 WATCH

Time And Temperature

BY JIM WALKER

Naturally, you could wear a diver's thermometer to gauge temperature, but in this age of the do-it-all digital watch, why not add a temperature feature? Casio has done just that in the TS-1200.

The back of the TS-1200 watch case is steel, but the rest of the case and band is tough, black polysulfone. Thus, it is ultra-light—only 1.1 ounces—yet shock resistant and depth rated to 330 feet. The TS-1200 is electronic (three year lithium battery) and digital, resulting in a low profile design with no moving parts to wear out. The wrist strap has a stainless steel buckle and can be adjusted quickly to accommodate a wetsuit sleeve.

The watch has a variety of displays and functions controlled by four buttons on the sides of the case. Three of these buttons can be pressed with gloved fingertips and the fourth will not need to be pressed underwater. The procedures by which the various functions are set and displayed are described in simple instructions, accompanied by graphics, supplied with the watch.

The TS-1200 displays date, time (12 or 24 hour, plus eight world time zones), daily alarm, time signal (hourly) and stopwatch with lap times. It also offers a temperature alarm function that can be set to sound for any maximum or minimum temperature. The current temperature display appears in the upper right of the watch face and replaces the date when desired. It can be switched to read in Fahrenheit or centigrade at the touch of a button. There is also a graphic temperature bar that runs across the top of the face. The digital temperature and graph are adjusted automatically every two minutes or can be updated manually at the touch of a button. The temperature of the watch itself affects the readings; consequently, changes in air or water temperature will




The TS-1200 watch displays ambient temperature digitally (upper right) and graphically (segmented line at top).

require the watch to assume the ambient temperature before readings are accurate. The instructions indicate this could take up to 20 minutes in air or four minutes underwater. However, I found that within one minute of crossing a thermocline underwater the sensor had stabilized at the new temperature. The watch can be set for on or off-wrist readings, with the former accounting for warming from the skin. This is not a factor U/W if the watch is worn over a wetsuit sleeve.

A typical dive scenario with the TS-1200 would go something like this:

Strap the watch over the wetsuit sleeve. Set it for displaying the current time and temperature (off-wrist mode). Snorkel to your point of descent. Switch the display to stopwatch mode, press the start button and begin your descent. To prevent the stopwatch from being stopped accidentally, switch the display back to current time. The stopwatch will continue running without being displayed. Observe the temperature of the water as desired. When the dive is over, switch the display back to stopwatch and press the stop button. This will freeze your dive time on the display. Again, switch back to current time to prevent accidentally clearing the stopwatch display. At the surface you can record your dive time and reset the watch to track your surface interval.

If you want to make your dive without pressing buttons, just mentally note your starting and ending times from the current time display.

Not only is the TS-1200 rugged and lightweight, offering a host of functions, it is also inexpensive—just \$39.95. It comes with a one year limited warranty. For a close-up look at this little performer, visit your dive store. For dealer information contact Casio, Inc., 15 Gardner Road, Fairfield, NJ 07006. 



# BAY ISLANDS

HONDURAS, C.A.





# BAY ISLANDS



## Honduras; Central America's Horn Of Plenty

TEXT AND PHOTOGRAPHY  
BY RICK FREHSEE

A diver examines a large spider crab (*Mithrax*) at Halfmoon Bay Wall off Roatan.



Bayman Bay Club



Roatan Lodge



Reef House

Barbareta Beach Club



Today, there are at least two kinds of Caribbean to consider. One is popular, well-traveled and surrounded by a full selection of amenities and commercial attractions. The other is more adventurous, comparatively undiscovered and reminiscent of an earlier era. The Bay Islands of Honduras are in this second category.

To get to the Bay Islands, head directly for Central America and hang a sharp left. The adventure begins on a modern jet into Honduras, transfers to an unmodern DC-3 (C-47 to you military types) for a series of island hops on crushed coral clearings and then continues by truck, taxi, boat or dory, eventually arriving at your resort. It's not quite *Romancing the Stone*, but parts of it are real close. The point is that you *can* get there in the same day and 97 percent of the time you do. But no matter: What is a little harder to get to is so much harder to forget. The Bay Islands are the classic portrayal of forgotten tropic isles and, for many of us, the most perfect paradise we've seen.

From the air they appear as emeralds in a deep blue sea—a string of verdant mountainous islands and pearly cays that fall like teardrops off the face of Central America. From sea level, the view is equally arresting with tropical forests climbing to mountainous heights and a coastline of palm-fringed ironshore alternating with crystal white sand beaches graced by stately royal palms. It's a scene that dazzles the most seasoned travelers among us and, as writer Lafca-

CoCo View Resort



Pirate's Den Hotel



Plantation Beach Resort



Caribbean Sailing Yachts

Anthony's Key Resort





dio Hearn (1887) suggests, "so far surpasses imagination as to paralyze it."

To those poor souls who are permanently programmed into the technological age there will be pangs of insecurity. Without phones, newspapers, TV, super-highways, shopping centers, fast foods and crowds of tourists, the islands of Utila, Roatan and Guanaja, and the islets of Helene, Morat, Barbareta, and Big and Little Cochinos (and their associated cays), will be viewed by some as behind the times. Last year there were less than 6,000 total visitors. The Bay Islands are still remote and seductive, displaying an undisturbed, unencumbered way of life. Tucked away in a corner of the western Caribbean and protected by the hush of time, these islands accept or reject the advances of civilization according to the beat of their own drums.

A characteristic feature of Bay Islands reefs are the buttress channels associated with tidal flow or river runoff, which transect the heavy reefs perpendicular to the offshore wall, forming extensive meandering clefts. Often these fissures are deep and narrow, creating interesting tunnels for exploration. In places coral growth seals off the top of the channel, forming real cave and cavern systems through the reef. Occasionally these fissures are hundreds of feet wide and more than 100 feet deep, forming dramatic drop-offs leading to the outer walls.

Other common features are solitary pinnacles or groups of pinnacles 80-100 feet tall, found adjacent to the outer walls. In some sites, such as famed Mary's Place on the southern side of Roatan, huge sections of the wall have cracked under tectonic stress and separated from the main formation, creating deep, narrow clefts and swim-throughs. There are many variations on that theme throughout the Bay Islands.

Most shallow reef areas provide an awesome and colorful spectacle below. One marine biologist estimates that 58 of some 65 known species of Caribbean stony corals can be found in the Bay Islands. (The other seven are probably here, but no one has found them yet.) Anyone who has snorkeled or dived the shallow reef at West End, Roatan, will agree. Here, and at select spots along most of the Bay Islands, is a virtual museum of corals, creating a dizzy display of shapes and species.

Prominent and easy to find reef fishes include angelfish, a variety of butterflies, yellow coneys, triggerfish, parrotfish, royal grammas, blackcap baslets, butter and indigo hamlets, jewelfish, spotted drums, squirrelfish and damsels. There are a number of dive sites that feature groves of garden eels, fields of jawfish and the curious-looking batfish. Many locations provide mind-boggling parades of creole wrasse and blue tangs (surgeonfish). Some offshore sites offer encounters with eagle rays, schools of jacks and the occasional shark. This year, I saw my first

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## R E S O R T S

### ROATAN/ BAY ISLANDS



# BAY ISLANDS

marlin underwater—on the end of a fishing line.

There is an unusual abundance of the stony coral *Dendrogyra* (pillar coral), a statuesque formation usually quite rare throughout most of the western Atlantic and Caribbean. Whatever environmental criteria demanded by this species are certainly found here, particularly in Roatan where pillar coral occasionally reaches heights of 10-12 feet from its base. It is, in fact, the corals and invertebrates that provide the majority of underwater signatures possessed by the Bay Islands. In addition to pillar coral, the starlet and shingled lettuce corals are extremely well formed along the drop-offs. And, all along the walls are beautiful and numerous sponges. In shallow water, on night dives, a tube anemone will make a stunning macro portrait with slender translucent tendrils flowing in a slight current. At mid-depths, along the lips and overhangs of drop-offs, are prolific formations of yellow-buff tube sponges, yel-

low and blue azure vase sponges, red and purple rope sponges and bushes of fuzzy yellow gorgonians. Deeper are trees of black coral and huge seafans mixed with lacy bryozoans. A Bay Islands regular is the big Caribbean spider crab, *Mithrax*, with an arm and claw span almost as wide as a diver's reach.

The Bay Islands dive resorts are a pleasant grouping of lodges, guest houses, hideaways and plantation-style resorts. All are distinct, individual and, without hesitation, many will be considered among the most irresistible resorts in the world. In addition to the traditional land packages, there are live-aboard sailboats at CSY and, at CoCo View, there is a surf and turf combo—three nights aboard a motor sailer and four nights at the resort.

The dive boats and diving operations throughout the Bay Islands compare favorably with other areas of the Caribbean. Generally, the larger the resort, the more complete the diving services, but everyone included in the survey can provide an acceptable level of services. Experienced divers can rest assured they will be treated well in the Bay Islands.

One word of assurance may be necessary: Honduras is still generally regarded as an oasis of peace in a sometimes turbulent Central America. The periodic border problems and isolated incidents detailed in the press have not affected travelers to the Bay Islands. We can only re-

port that none of the SKIN DIVER entourage that accompanied the preparation of this article felt the slightest uneasiness or intimidation on the mainland. Indeed, this writer makes several trips to Honduras each year without the slightest hesitation. The Bay Islands are, for the time being, a little harder to get to. This is a reality and is part of the reason they are so pristine and undisturbed. Consider this an adventure! Swagger in like Indiana Jones. Prepare to be fed pompously, dived until you are salt-sore and seduced by a set of islands that rival the exotic tropical splendor of the far South Pacific. Plan to discover this spectacular dive destination before the crowds rush in.

## ANTHONY'S KEY RESORT

From the air it looks like a South Seas plantation. From ground level, at a distance, it looks like a Gauguin painting; the view up close is even better. Forty-four bungalows spill down Roatan and continue around picturesque Anthony's Key (formerly a coconut plantation).

Nobody today knows who Anthony was, but the little island named after him is now the home of the largest and most complete dive resort in the Bay Islands. There's a good view no matter where you stay (my personal preferences are rooms 46-48) and everybody enjoys the Peter Hughes dive operation, which hums with precision and orderly arrangement. In ad-



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# DIVE

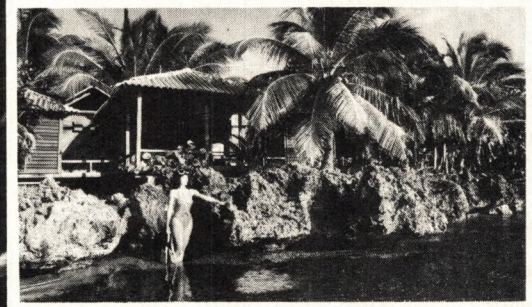
## Anthony's Key Resort

If Eden was an island — it could well have been Anthony's Key off the island of Roatan in the western Caribbean.

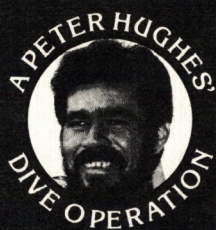
The resort is more like a tropical plantation than a hotel with natural wood bungalows scattered on a small islet and across a verdant hillside. The coastline offers long stretches of creamy white beaches fringed with stately coconut palms.

Right off our dock in the resort lagoon is some of the best close-up photography and night diving in the Bay Islands. Our resort now offers complete photographic services including over-night E-6 film processing, u/w equipment rentals and instruction. Offshore is an incredible world of crystal waters, mammoth coral canyons, winding tunnels, huge stands of pillar coral, and vertical walls of throbbing color.

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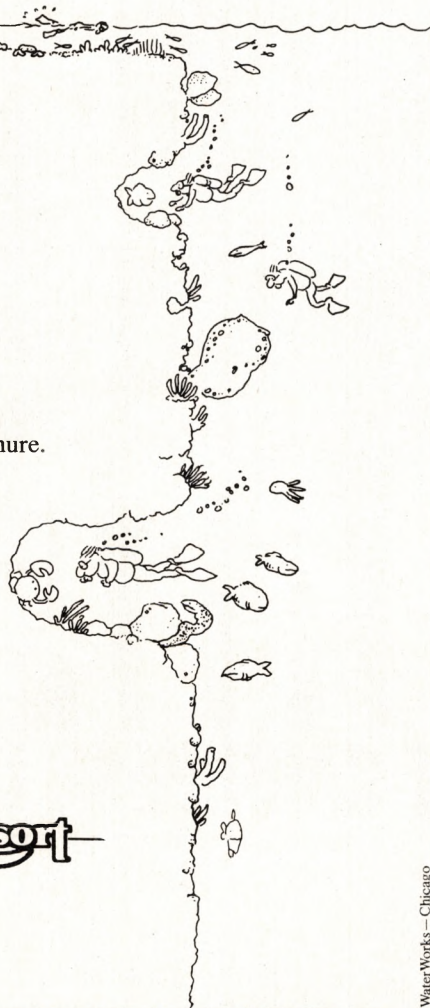
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# BAY ISLANDS

dition to the four comfortable boats with two huge compressors, there is Photo Roatan with daily E-6 processing, camera repair and rentals and a new U/W video rental and personal cassette program.

The mainhouse on the hill is the open air restaurant and bar, which provides good food and good times. Don't miss the coconut candy! There is a full program of activities including tennis, board-sailing and sailing (in the beautiful, protected lagoon), horseback riding and the classic West End beach picnic (every Wednesday)—a romping good time on one of the world's great scenic beaches.

The diving around AKR, 5-30 minutes from the dock, is some of the best in the Bay Islands. The **Bear's Den**, **Peter's Place**, **Halfmoon Bay Wall** and **Herbie's Fantasy**, to name a few highlights from the list of 30 plus dive sites, are all great but don't miss the **West End Bay Wall** for a truly spectacular Roatan dive. Deep divers will find the **Hole in the Wall** a memorable experience. Herbie Jackson and Sammy Wesley are ten year veterans of AKR diving and continue to be two of the best divemasters in these islands. Mandy Wagner, the new resident manager, is charming and efficient, a smart addition to AKR personnel. This place is magic! Be prepared to fall in love with an island.

### PIRATE'S DEN

Any dive operation hosted by Tino Monterosso has to be friendly and efficient, and so it is with Pirate's Den Resort. Tino is a popular, 11 year veteran of Roatan diving who has earned my highest respect and admiration over the years. But Pirate's Den is more than Tino, especially now that the hotel has been renovated, remodeled, landscaped and is under new management. Pirate's Den tries hard not to be a continental hotel and is proud of its Latin-American and Bay Island heritage. Real Honduran customs and good Latin food prevail. Pride is reflected in the excellent menu and in the music (island groups) and the spontaneous gaiety of the evening. There's a beach barbecue to consider and a fantastic West End picnic on the resort's private beach.

The dive sites are practically the same as Anthony's Key. (These are currently the only two dive resorts in the Bay Islands that are within walking distance of one another.) Tino does have a few special spots to show you. (Ask him about his reef "pets.") At least once a week there is a trek around the island to visit

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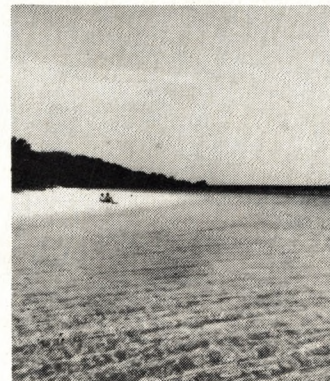


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# BAY ISLANDS

**Mary's Place**, one of the best dive experiences in all the Bay Islands and named after Tino's pretty wife. When you're all dived out, try the waterskis or arrange for a car trip to French Harbor.

There are 13 units, all cooled by fans and connected by verandas. Six more units by the beach and local houses are available if there's a small crowd.

## CARIBBEAN SAILING YACHTS

There is nothing in the same category as CSY in the Bay Islands. It is unique and individual both in form and function. Picture a country club or yacht club setting with a beautiful 20 by 40 foot freshwater pool, enriched by a wooden deck. Consider 20 air-conditioned rooms (the only air-conditioned rooms in the Bay Islands), modern and nicely appointed. At the huge dock are 17 handsome, 44 foot sailing yachts and a single 36 foot twin diesel dive boat.

At CSY you can charter a live-aboard sailboat with compressor and tanks and plan your own dives; or opt for the standard hotel package and make one, two or three dives per day in modern comfort aboard the custom dive boat. One day of sailing is also part of the hotel package.

General manager Marco Galindo and dive operations manager Allan Bruce offer a beautiful package with great flexibility for dive groups and individuals. They can show you shallow coral forests, beautiful walls and big barrel sponges or white sponges, wire corals and huge canyons and caves, all just minutes away. Allan is quick to point out that of all the Roatan resorts, CSY is closest to famed Mary's Place and he can show you 20 more spots once you've caught your breath.

The food is very good; the restaurant and bar overlook the scenic yacht harbor. CSY is pleasant without being posh, modern without losing its island flavor. With this comparative elegance you would expect it to be expensive—but check the prices and packages and you'll be pleasantly surprised.

## ROATAN LODGE

Port Royal Harbor was once the base of the legendary 17th century pirate, Sir Henry Morgan—and therein lies the mood, mystique and magic of Roatan Lodge, a pirate's lair if there ever was

one. This is not mere coincidence or fabrication. It is truly believed that the present facility was built over the original pirate's stronghold. Today's Roatan Lodge is indeed a treasure, waiting to be discovered by the modern world seeking isolation, solitude and adventure. The bungalows (there are only five units, 10-20 people maximum) are clean, comfortable and in keeping with the surroundings (high on a rocky hillside). Fashioned of native cedar, they feature a private bath, your own veranda with hammock and a magnificent view overlooking the harbor. The mainhouse, which is the restaurant, bar and social center, looks like an old English cottage. It has rosewood beams and is decorated with authentic artifacts.

Manager Mike Brown is a laid-back Californian who obviously enjoys his present mission at the lodge. The food is fabulous; cook Josie Matute prepares the best meals of all the resorts in the Bay Islands. Captain Howard Matute and dive-master Gregory Bodden are savvy veterans of Port Royal diving. Within 20 minutes of the lodge are dozens of dive sites, mostly wall dives and mostly close to shore. There are cracks in the wall, creating meandering paths to the drop-off, and the visibility is normally very good.

This is an excellent choice for small groups, intimate couples and families looking for a private experience and pleasant memories.

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## THE REEF HOUSE

At high tide (different from low tide by about a foot) the crystal sea laps against the front porch of the Reef House. You can literally walk out of your room with a tank on your back and snorkel or scuba out to the wall 300 yards away—convenient to say the least.

The Reef House sits on tiny Oak Ridge Key in front of the harbor and settlement of the same name. It is reported to be the oldest dive resort on Roatan and is currently open under new ownership and management. Allan Pilkington, a Britisher with a background in emergency medical procedures, represents the new group as resident manager. The rooms are comfortable and pleasantly furnished, island style. They have a combination of glass doors and wooden jalousies and are set into three wings. Food is served in the main dining room at the end of the east wing and groups of up to 20-28 divers can enjoy traditional and island specialties served buffet style in generous proportions. At the other end of the wing is the cabana bar facing a panoramic view of the Caribbean.

The 38 foot diesel cruiser *Henry Morgan* (a familiar name in these parts) travels twice a day to nearby southshore reefs and sheer drop-offs along the south coast. **Calvin's Crack**, an example of one of the many reef fissures around the island, is probably the best dive site close by. There are more than 20 known dive sites from French Harbor to Port Royal with day excursions to Barbareta and Pigeon Keys.

For other diversions there is bonefishing (bring your own tackle), dory rides through Jonesville, island tours and excursions to French Harbor.

## COCO VIEW RESORT

CoCo View is currently the second most popular dive resort in the Bay Islands—and for good reason. It is as comfortable as an old deck shoe and as unpretentious and friendly as any place could be. The staff members are more than friendly—they're family.


CoCo View is a dream shared by Bill and Evelyn Evans, the resort's mom and pop and the major owners and co-managers. Bill, an experienced Caribbean pilot, diver and sailor, landed here with Evelyn several years ago and "fell in love with Roatan." The brain behind the dive program is Doc Radawski, who came here from the States 15 years ago to conduct archaeological research and has stayed ever since. Doc is the island expert on a variety of subjects from underwater biology, geology and archaeology to Bay Islands lore. He's extremely knowledgeable without being a know-it-all and his integrity and love of diving and the sea are unsurpassed in these islands.

Diving is what CoCo View is all about. The wall in front of the resort is perhaps the best beach dive in Roatan. There is a variety of sites within swimming distance

of the beach and the walls start in only 20 feet of water. Doc estimates that 85-90 percent of all the known species of Caribbean stony corals are within a half mile of the resort. Mary's Place and **Doc's Dive** are two sites not to be missed.

The resort facilities include a clubhouse with restaurant, bar, game room and an excellent briefing area, a dockside dive shop and storage area, and 18 upstairs and downstairs rooms split into two buildings.

CoCo View deserves recognition for several firsts on Roatan. It is the first (and only, to date) resort to have installed a series of permanent moorings at the most popular dive sites. Huge cement anchors



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# BAY ISLANDS

and attached buoys eliminate anchor damage; seven moorings have been installed to date. And, the **Prince Albert**, a 140 foot, steel hulled tanker intentionally sunk in a natural channel just 100 yards from the resort, is a dive attraction and station for coral growth studies.

Topside diversions include a joyous picnic/barbecue on CoCo View's private cay, island excursions and a variety of watersports—but there's little doubt that the emphasis is on the underwater world. This is a resort run by divers, for divers.

## BARBARETA BEACH CLUB

Imagine an entire island all to yourself! It's not just any island, but Barbareta (or Barbaret or Barbarata, if you please)—a 2,000 acre piece of paradise between Roatan and Guanaja. The island was originally owned by the descendants of Henry Morgan but was acquired more than 20 years ago by Arthur Townsmiere Jr. of Mobile, Alabama. Townsmiere and company built the Barbareta Beach Club several years ago and, although the development has proceeded in fits and starts, it is presently open for business—and that includes scuba diving.

Development at this stage includes a restaurant, bar and an 11 unit lodge. We were hosted by a lovely couple who served as resident managers and dive-masters but who have since left Barbare-

ta. Pepper Townsmiere, a son of the owner and the island manager, accompanied us on some of our dives and kept us in stitches with his dry, Alabama sense of humor. The diving is absolutely fabulous. There are literally miles of virgin, undisturbed walls and drop-offs.

Huge jewfish are periodically reported as are frequent shark encounters at one site near Morat Island. A short distance south of Barbareta are two small, sandy islets—the Pigeon Keys, which look like a travel poster and are perfect for picnics, snorkeling and scuba. Nearby is a continuation of the Barbareta wall.

This place is a potential gem and, for those seeking discovery, quiet and isolation, it gets our approval and our highest hopes for a finished concept in the future. Call before you travel to verify the present personnel and dive package.

## BAYMAN BAY CLUB

I suggested to owner Tom Fouke that he close Bayman Bay Club to the public and open it only to select magazine writers. But he did not concur and is prepared to share it with others. The BBC has my vote for the most perfect setting for a small resort in the Caribbean. Picture perfect that is; it is the only dive resort on the beautiful island of Guanaja and it is as seductive as a summer's dream. Natural wood bungalows (there are only nine units) are perched on a tropical hillside, connected by walkways and surrounded by a thick forest of palms and pines as well as banana, almond, chicle, frangipani, hibiscus and mandarin orange trees. Below is a palm-decorated white sand beach that curves around to a wooden dock with a three story hut serving as an observation deck, a dive locker and air station. The dock leads to

steps that rise toward a treehouse-looking affair that serves as a mainhouse.

Resident manager and divemaster Alejo (Alejandro) Monterosso is a chip off the same block as brother Tino Monterosso (Pirate's Den): accommodating, knowledgeable and good natured.

There are at least 20 dive spots within 20 minutes of the dock. A pleasant mix of shallow dives, rolling mid-reefs, pinnacles and drop-offs can be anticipated. Large bights cut through the reefs, forming dramatic walls and ledges. New this year is the custom built 40 foot fiberglass dive boat. It can comfortably handle more divers than the resort can hold.

Here you can dive to your limit. Beach diving is always available; however, it is heart tugging to leave the beautiful beach and bay. The scenery behind the resort is mountainous pines and if you're adventurous, you can hike to a waterfall.


## PLANTATION BEACH RESORT

We had one more resort to visit and another day and a half of diving: What could have been anticlimactic wasn't. It was the Plantation Beach Resort and it was one of the best experiences of the entire trip.

The Cochinos Cays (Los Cayos Cochinos, or the Hog Islands as Hernan Cortez in 1526 settled his hog farm here) are incredibly beautiful. They are a couple of small islands that are lush and mountainous, and 11 small, flat cays that are mostly white sand and slender palms.

The resort is on the western side of Cochinos Grande (not so big, only six-tenths of a square mile). The mainhouse, a short distance from the 120 foot dock, is nestled in a tropical valley. Down the valley are half of the resort units surrounded by plantain, yucca and pineapple and cooled by artesian creeks and springs. The other half of the resort is perched on the hill leading up from the valley and looks a lot like a ski lodge in the jungle.

PBR is run by a "Swiss Family Robinson." Jim and Gae McDonald are co-managers and two daughters are employees. These people grew up on discovery and adventure. Jim is a master technician; you get the impression that if he can't fix it, perhaps it's not broken. The two young ladies work mainly as divemasters and island guides. Kenny Tasson, the divemaster and future son-in-law, took us diving on the **Roatan Banks**, one of 40 known dive sites. We had heard that the visibility might be less in the Cochinos Cays (closer to the mainland). Perhaps sometimes it is, but this time it was the best we experienced in the Bay Islands.

The banks were like an oasis in the sea: an elongated pinnacle decorated with corals and sponges and teeming with marine life. We spent half the dive surrounded by a huge school of goggle-eyed jacks. There are no drop-offs to infinity, as the reefs level off at 120 feet, but the corals and fish are splendid. 

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TEXT AND PHOTOGRAPHY  
BY STEVE LUCAS

**W**ith an enormous amount of expended energy, they explode to the surface. Their flows measured in levels of magnitude, these magnificent, incredibly clear underground rivers empty their liquid treasure at hundreds of locations across northern Florida. At Homosassa, Weeki Wachee, High Springs, Branford, Ocala, Mayo, Crystal River and Dunnellon, each gives up water so pure that some say visibility is forever.



**Above: Janice Lucas at Ginnie Springs. Left, down from top: Peaceful Ichetucknee River, egret at King's Bay, manatee at King's Bay, manatee monument at King's Spring.**



photo/Doug Perrine

With the largest springs releasing almost 2,000,000 gallons of drinkable water daily, they are a source of intrigue, mystery and hidden geological history. They have attracted explorers for centuries. Florida's Indians built villages and left the chronicles of their civilizations around and beneath these waters. The springs are the source of legends, of a supposed fountain of youth that brought Ponce de Leon to their banks and to his demise at the hands of natives.

The natural inhabitant of some of Florida's spring fed rivers, the manatee, led sailors to believe the peninsula's coasts were inhabited by mermaids. More recently these aquatic sea cows have become a principal attraction for the explorers of our planet's mysteries. Captain Cousteau, the Miami Seaquarium's manatee research group and re-



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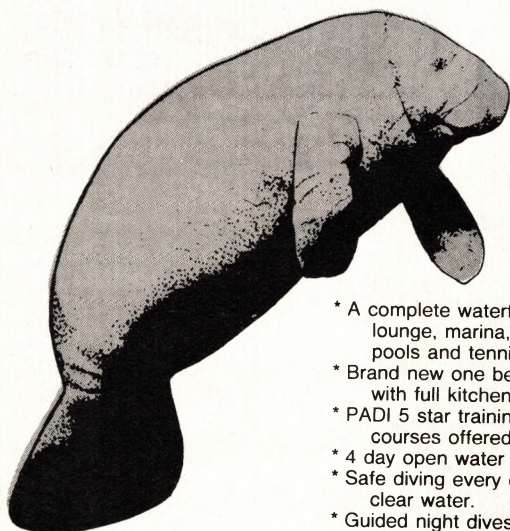
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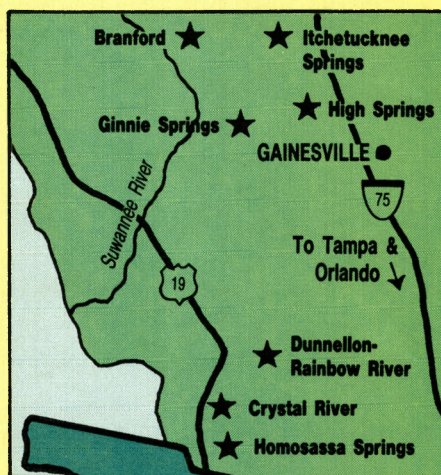
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## FLORIDA'S SPRINGS

searchers for major scientific journals have all been here to learn about this unusual marine mammal. Sport divers by the thousands come seeking one of life's most memorable experiences: A chance to swim with members of this endangered species.

Primarily concentrated in the upper third of the state, Florida's springs are ideally situated for weekend divers as well as families wanting to combine a week or two of diving and vacationing. Almost all of these pristine wells flow into wild rivers. Hotel accommodations are excellent near most spring dive sites. You can also park a trailer or pitch a tent at any of the numerous deep woods campgrounds. One specializes in diver accommodations. During your stay, try floating down any of the rivers on easily rented inner tubes, paddle a canoe into the backwoods, or sit on a log and fish the day away beneath a canopy of Spanish moss-draped cypress trees.

The majority of the state's top tourist attractions are within an hour, two at the most, of some of the best freshwater diving Florida has to offer. Down the coast, just a short drive south of Crystal River, one of the oldest and most popular tourist parks proves daily that Florida really does have mermaids. Weeki Wachee is



## FLORIDA'S SPRINGS

The crystal clear springs and meandering rivers of central Florida are easily reached and attract hundreds of thousands of divers and other watersports enthusiasts each year.



built completely around a first magnitude spring. With more than 1,000,000 gallons of water flowing from its mouth every 12 minutes, Weeki Wachee spring has a glassed-in theater where live "mermaids" perform their underwater magic and breath-hold dive to depths of well over 100 feet. The audience sits below the waterline in air-conditioned comfort, also holding its collective breath, while waiting for these free diving aquatic ladies to return from such incredible depths. The family outing park also has nature trails, rides, slides and a performing bird show.

Between Weeki Wachee and Crystal River, Homosassa Springs Attraction gives non-divers a view of life beneath a spring's surface where thousands of large fish come to stare at you through thick glass. The park has birds, alligators, crocodiles, orchids and scenic boat trips. It also serves as a research and recovery station for injured manatees. If none can be found in the wild, here you can be

sure of seeing several.

Near Ocala, Silver Springs is one of the most famous of the state's clear waterway parks. You can explore the sets of famous movies and TV shows. Most of the old Tarzan thrillers and Lloyd Bridges' Sea Hunt series were filmed here. Today, you explore the spring via a glassbottom boat, take a jungle cruise to see thousands of wild monkeys left behind by Tarzan and Jane, visit the Reptile Institute with its cobras, rattlesnakes, pythons and other native and exotic reptiles or see a display of valuable and rare antique cars.

Florida's most popular attraction, Orlando's Walt Disney World, as well as Ep-

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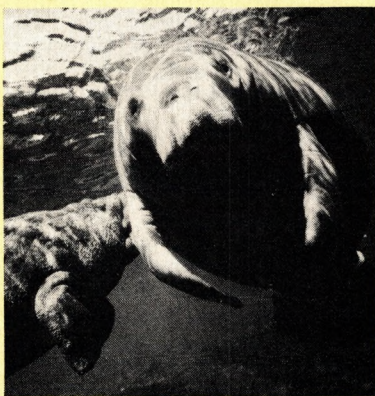
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### HELP SAVE THE MANATEE

The manatee can weigh over 1,000 pounds and reach 10 feet in overall length. Its only natural enemy is man. Over 10 percent of the state's manatee population may die each year, many killed by careless, speeding boaters that ignore protected waterways. A boat prop can easily kill or maim the manatee.



photo/Doug Perrine

The State of Florida recommends the following steps to help save them:

1) Slow down in areas known to be inhabited by manatees. These usually have warning signs posted.

2) Do not touch manatees. Take all the pictures you want, but only if the animals approach you. Do not chase them.

3) When fishing, do not discard tangled line. Manatees are injured by fish-hooks and line hidden in plants they eat.

For information on manatees contact:

Save the Manatee Club  
Florida Audubon Society  
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Report injured animals or information about their abuse to:

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## FLORIDA'S SPRINGS

cot Center, Sea World, Circus World and Cypress Gardens, are also nearby. At Tampa/St. Petersburg, south of Weeki Wachee, soak up some sun on the wide, white sand beaches of the Gulf of Mexico. For a really wild day visit the Serengeti Plains with its thousands of wild African animals, the rapids of the Congo and the belly dancers of Marrakesh. All are at Busch Gardens' Dark Continent in Tampa.

The diving areas of Florida's freshwa-

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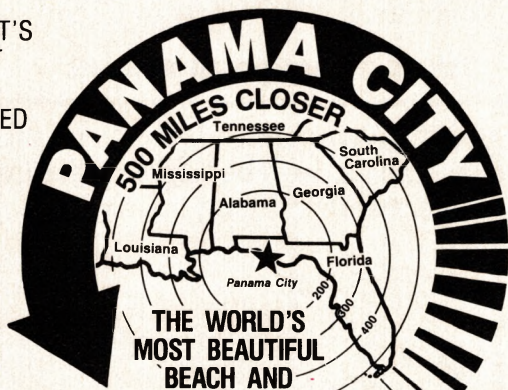
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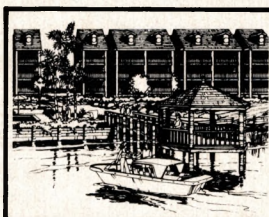
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ter springs are divided into two major regions. The largest concentration of dive operators and resort hotels is clustered around the banks of King's Bay in Crystal River. This is where the manatee is most common between November and April. The largest variety of springs is found 80 to 100 miles to the north between Mayo, Branford and High Springs.

Most of the state's divable wild springs are in a fairly compact area along the banks of the Suwannee, Ichetucknee and Santa Fe rivers. Close to 30 are known by divers in this area, but less than a dozen are commonly dived.

Near Branford, Troy Springs is one of the most popular in the area. So many divers can be found in it on weekends, the bubbles breaking the surface make it look like an enormous, clear, carbonated soft drink. On weekdays it, and most others, are virtually vacant. A first magnitude spring, almost 100,000,000 gallons flow daily from its mouth. Eighty feet deep around its edge, its sheer rock walls drop straight to the bottom. On the way to its Suwannee River run, the water has carved a natural U/W stone arch. Divers can easily traverse its ten foot length, then pass schools of mullet while swimming to the ribs of the steamer *Madison*. She was deliberately sunk in 1863, when her captain decided fighting the Civil War was more important than his ship.

Sixteen miles north of Branford, another deep spring flows into the river. Royal gets its name from its rich, royal blue water. More than 100 feet wide, its steep banks drop straight down, forming sheer walls. Large boulders and trees are scattered across its submerged basin. At 50 feet the spring becomes a dangerous, silty cave. This area must be avoided.

Twelve miles to the east of the town, the Ichetucknee River flows right out of the ground. A perfectly clear, shallow river, it is popular with swimmers and tubers on weekends. Divers can enter upstream inside the Ichetucknee Springs State Park to drift three miles underwater in depths rarely more than a dozen feet. Along the way, it is possible to find an Indian artifact before being picked up at the Highway 27 bridge.

Twenty four miles west, near Mayo, Peacock Spring is another popular Florida freshwater site. Having a shallow slough, at a depth of less than 20 feet the spring becomes a cavern/cave system


that must only be entered by those certified in cavern diving techniques. At its entrance a school of bream work their way in and out of the sunlight. The water from the underground stream flows beneath thousands of lily pads, finally becoming a part of the Suwannee.

Eleven other springs and sink holes are found in this immediate area. Some are suitable for sport divers, others require specialized equipment and training. Orange Grove normally has excellent visibility and reaches a depth of 60 feet. However, you will likely end up looking like the monster from the black, or green, lagoon when you exit the water. The sink is

covered with a thick layer of sticky duckweed that clings tenaciously to wetsuits.

All the springs in the area are serviced by a well stocked, full service dive store on the banks of the Suwannee River—Branford Dive Center. Springs Systems, an air supply station just out of Mayo, has recently opened near Peacock.

Seven miles west of High Springs is the only full service camping and diving facility in Florida. Ginie Springs resort has a general store, campground, showers, canoe rental and complete dive shop. A private park, it charges a fee for diving and use of the park camping and picnic facilities. Three of the park's



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#### CAUTION

Many of Florida's springs become dangerous cave systems only a few yards from their entrances. *Every year untrained and careless divers die here! Do not enter any cave!*

Sanctioned training is required to dive in the cavern openings. Such courses are available at several of the operations listed in our dive store directory. Don't take chances.



# FLORIDA'S SPRINGS

springs are very popular with divers: Ginnie, Devil's Eye and Devil's Ear. All have easy entrances with wooden decks and stairways built around their edges. Ginnie is the most popular. Its cavern can be safely penetrated to a depth of 60 feet, even by novices. Just inside the narrow opening, the spring turns into a large chamber with boulders scattered about its floor. A permanent guideline leads down to the entrance of the cave, which has been sealed with a steel grate. Outside the cavern opening, schools of bream and bass come out of hiding and completely surround you if they even suspect you are offering them food. Fingers are sometimes mistaken for hot dogs!

Devil's Eye and Devil's Ear are a part of the same spring system. The Eye, a cylinder shaped opening dropping straight down, can be entered safely to a depth of just more than 20 feet. There, an enormous log is lodged in the cavern. Divers without cavern certification should not pass this point.

Devil's Ear is just at the spring's junction with the Santa Fe River. Another felled tree lies across its mouth. This system quickly becomes a cave that must be avoided. It's a geological storehouse where specially trained survey teams have uncovered skeletal remains of some very rare land animals as well as the vertebrae of a prehistoric whale.

Depending on the time of year and water level, the Santa Fe can be as dark as coffee (with very limited visibility owing to the tannic acid of the surrounding

swamps) or clear, with visibilities of more than 50 feet. Even in limited visibility it is an exciting shallow dive. Artifacts, such as Indian spearpoints, arrowheads, and fossilized shark's teeth, have been found in the cracks and fissures of the river bottom. The Santa Fe is also popular with canoeists and tubers.

One-half hour northeast of Crystal River, the Rainbow River percolates its way through the sand at Dunnellon. Thousands of tiny springs release their waters through small openings, making the sand appear to boil. Rarely deeper than 16 feet, its shallow banks have giant elephant ear plants hanging over the water. This canopy serves as cover for large-mouth bass. Sorry, by city ordinance, no fishing allowed! The water in this river is so clear, visibility has sometimes been measured at greater than 300 feet!

Unquestionably, the most popular spring in Florida is found in King's Bay at Crystal River. On U.S. 19 north of Tampa, the dive operators here are equipped to handle virtually any number of divers. The city has an excellent variety of restaurants and hotels and actively promotes dive tourism.

The West Indian manatee is the reason Crystal River is so well known. During winter, when the Gulf of Mexico is cold, it seeks the food and warmth of King's Spring's 72°F water. A large, slow moving marine mammal, it sometimes comes directly to you and nudges gently as if insisting you scratch its back. However, divers are cautioned that federal and state laws protecting this endangered animal specify penalties for "harassment." In recent years some officials have ruled that any contact with a manatee is harassment. Even swimming toward one, if

it appears you are chasing it, can net you a fine. Prudent divers will wait for the manatees to come to them and then still make observations at a discreet distance.

King's Spring is a fun dive, even when the manatee is not present. With a basin depth of 30 feet, a cavern can safely be entered to a maximum depth of 60 feet. Thousands of mullet work their way around the shallow edges of the spring feeding on algae. Inside the basin, several hundred bream and blue gills wait to attack the hand of any diver offering food.

Other King's Bay springs that are sometimes dived are Catfish Corner, Mullet Spring and Grand Canyon Spring. Other springs are in restricted zones during the manatee season. A check with a local dive operator is a prudent idea before taking off on your own.

Renting a boat to get to King's Bay springs is simple. Almost all local dive operators rent drive-it-yourself john boats, as well as provide air, rental equipment and supplies. Crystal Lodge Dive Center, Palmetto Scuba, Plantation Inn Marina and Sand Dollar divers are affiliated with large hotels. Personally guided tours can be arranged through Sand Dollar or Talley's Pro Dive. All but Talley's and Sand Dollar are on King's Bay. Talley's is on U.S. 19 and Sand Dollar is inside the Holiday Inn, just north of the city.

Just inside King's Spring, a recently placed monument with the words of Dr. Harvey Barnett expresses the sentiments of most of those who have swum with manatees. "Life must become more than the wants and needs of humans," it begins. "We are not on this earth alone. If the manatee goes into extinction because the needs of humans became more important then we will have taken another step backward toward our own demise. Extinction is forever and for all."

Once you visit Florida's springs and see the manatee, you will likely add only one word to that tribute: Amen. 🐬

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# SUBSEA HALLOWEEN HAUNT

## Seattle Divers Take Art of Pumpkin Carving To New Depths

TEXT AND PHOTOGRAPHY  
BY STUART WESTMORLAND

to share diving information via guest speakers, underwater slide presentations and reviews of upcoming club sponsored dives. Among our many annual events, the Halloween fest usually brings out the beast (I mean, the best) in fun, food and underwater entertainment.

It all takes place at Alki Point in West Seattle, a scenic waterfront park overlooking Puget Sound. Covered picnic areas allow festivities and our potluck "pork-out" to continue during rain, wind or sunshine.

Enthusiasm is infectious as pairs of divers romp into the nearby water oblivious to the cool air, choppy water and thunderstorm of our 1984 celebration, heavily

**C**an you imagine monster masks, sharp dive knives, plentiful pumpkins, prizes and a picnic feast?

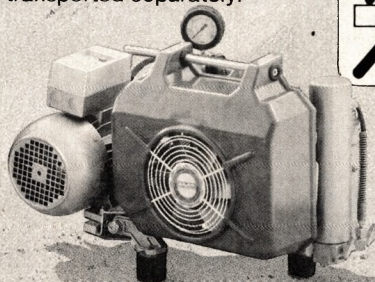
If not, then you missed the Underwater Pumpkin Carving Contest, an annual Marker Buoys dive club event.

In Seattle, Washington, the Marker Buoys is an active scuba diving club promoting fun and fellowship among regional certified divers. Local or out-of-town dive trips are organized almost every other weekend. Monthly meetings are held

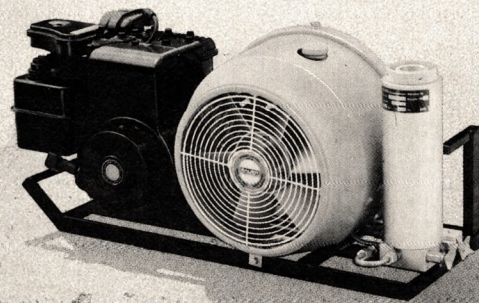
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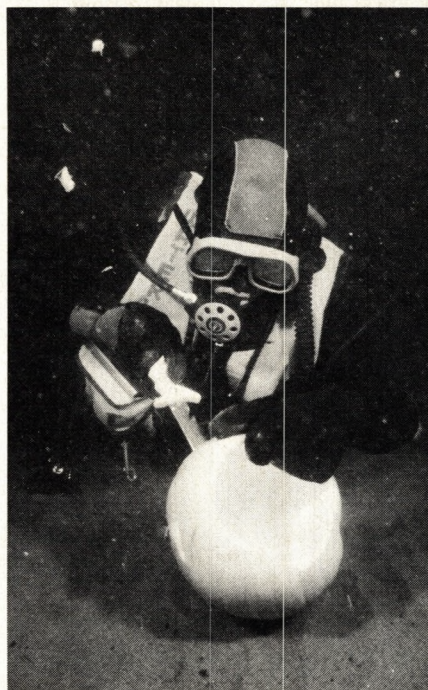
encumbered by pumpkins, flippers and goodie bags. The fun is about to begin.

Pumpkins are somewhat hollow and therefore very buoyant in the water. The most difficult task is getting the darn things to sink. Contest rules state: 1) All carving must be done in the water away from shore. 2) Dive knives are the only tools allowed for carving. 3) Upon entering the water, all pumpkins must be uncut and not marked with any designs.

Compounded by the disintegrating effects of salt water, Halloween haunters must work quickly before their endeavors become waterlogged messes.

The sandy beach on shore continues underwater, providing a gently sloping dive site. Small rocky outcrops provide a habitat for schools of ocean perch, rockfish, sea stars and nudibranchs.

Teams are advised to stick together like glue. Underwater visibility deteriorates rapidly from flying sand, silt and squash innards. The schools of perch and rockfish seem confused by all the commotion; after spitting out mouthfuls of pumpkin seed, they prefer to observe the proceedings from a safe distance. What probably disturbs the fish most are the strange gurgling sounds emanating from the vicinity of the commotion. If you've ever tried laughing uncontrollably in your regulator (multiply this by 30 odd divers), you'll understand what I mean.



Photo/Steve Ladd

All pumpkin carving took place in the water. The pumpkins float until cut open.


Goodie bags with rocks or lead weights are most often used to submerge participants and their orange, globular pursuits. The mammoth-sized "super squashes" are always too big for a goody bag and require teamwork to ma-

neuver underwater. Once the top is cut off, they fill with water and can be pushed to the bottom. Although perfectly legal, carving on the wind-blown surface would be extremely difficult, not to mention dangerous to you and your buddy's fingers.

In view of all these complications it's amazing how many works of art appear on the judges' table every year. Two non-partisan judges choose winners in the following categories: biggest, wimpiest, best-looking and most original. Prizes are donated from dive club funds and local scuba shops. Goodies have included dive lights, regulator repair certificates, gear bags, marine identification books and club T-shirts.

Participating divers, along with their spouses, friends and family, contribute to a massive potluck picnic during and after the carving contest. Hot spiced cider and coffee await the divers along with a mouth-watering assortment of hot and cold dishes, salads and desserts.

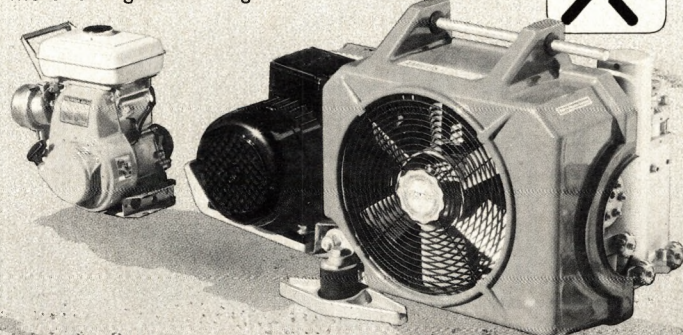
The local ABC television news team filmed our gathering and billed the news clip as, "The most unusual Halloween celebration you're ever likely to see!"

While our dive club might be unusual, gatherings of this type can be one heck of a lot of fun. If you'd like more information on the Marker Buoys or on organizing your own dive club, contact: The Marker Buoys, P.O. Box 21008, Seattle, WA 98111. 

# from BAUER

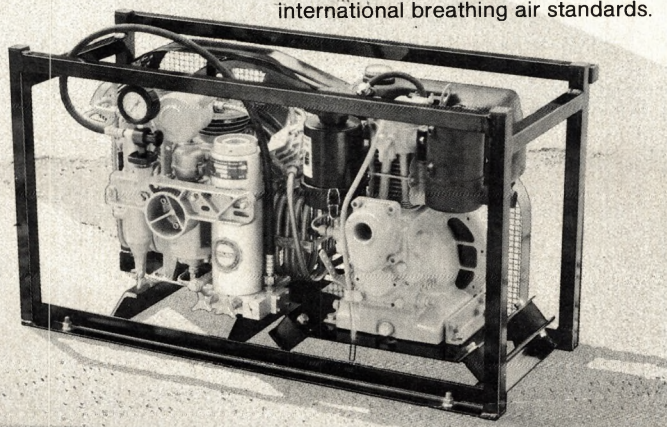
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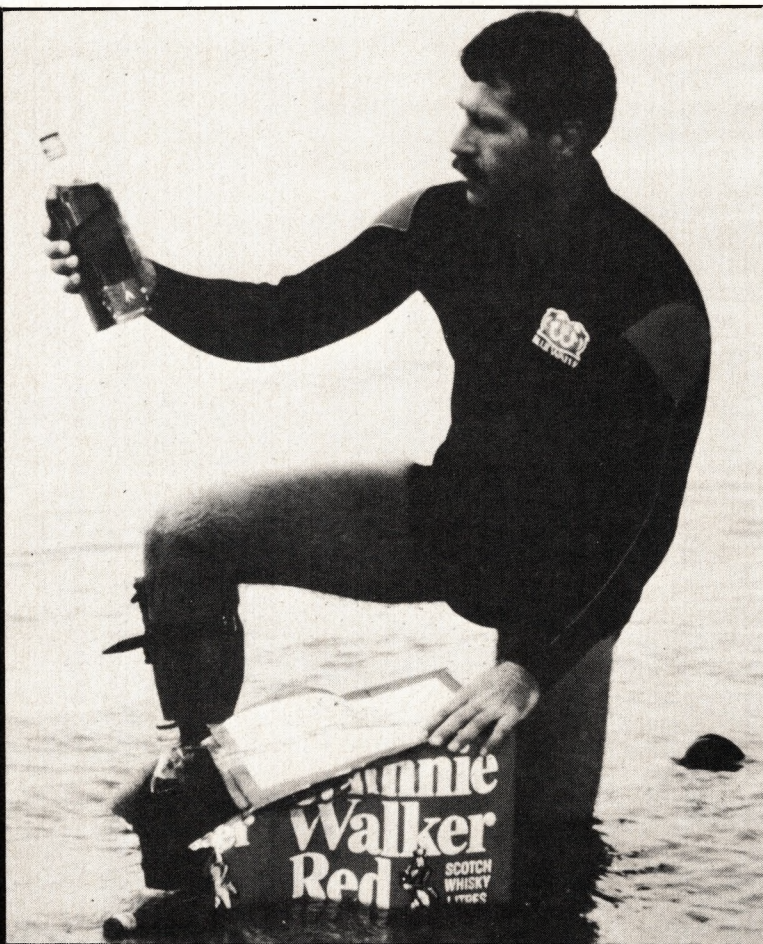
# Bottled Booty

Christmas Eve  
Treasure Hunt  
Uncovers "Liquid Gold"

TEXT AND PHOTOGRAPHY  
BY JERRY POKORNY

In the travels of every diver there is always one special experience that will come to mind long after hundreds of other underwater excursions fade into nothing more than cryptic entries in a log-book. For some it may be their first night dive, an experience on a wreck or some other personal thrill of discovery. For my family, it was a Caribbean Christmas Eve underwater that yielded us holiday treasure from the deep.

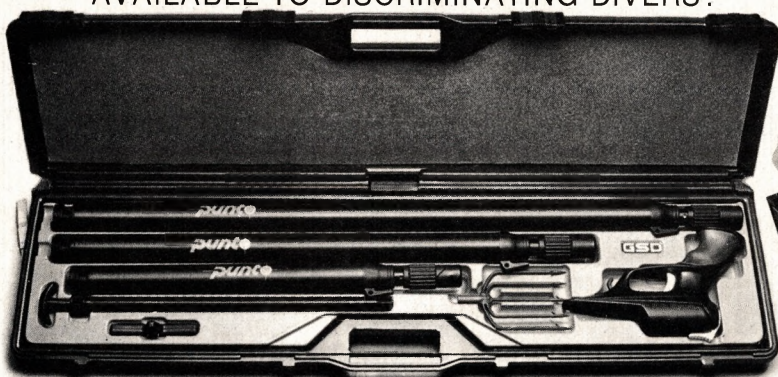
My wife, daughter and I were on a one day stopover in Bridgetown, Barbados, as part of a cruise vacation. The legendary reputation of this harbor as a place for collecting old bottles seemed to make it an ideal site for our daughter to make her first ocean dive after certification. With an abundance of collectible glass at shallow depths, there was every expectation of bringing home souvenirs. What fol-



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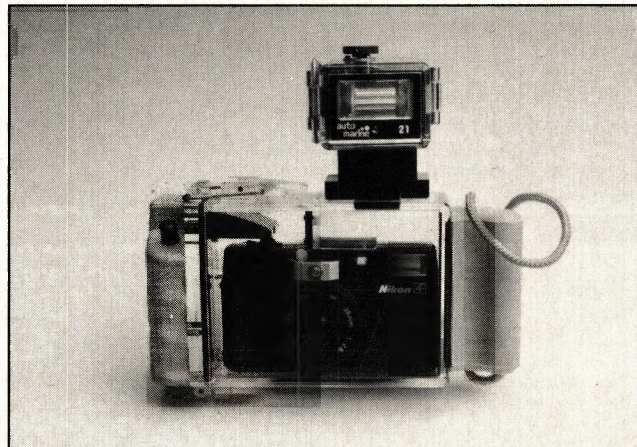
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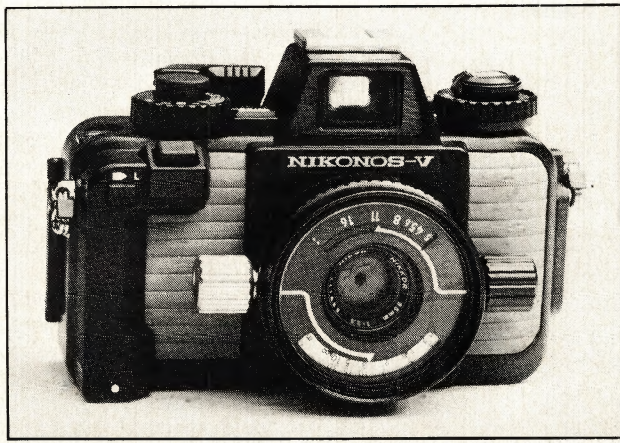
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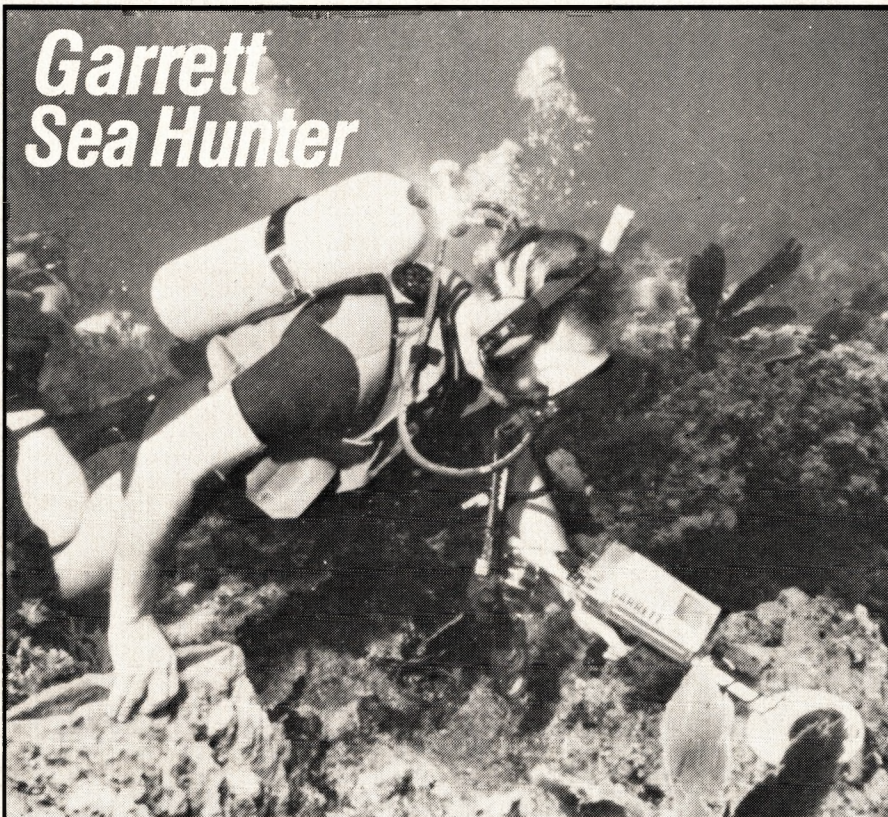
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## BOTTLED BOOTY

lowed exceeded our expectations.

At one of the local island dive shops, we were introduced to our dive companions, Darald, from Chicago, and Jerry, from Ontario, Canada. After a thorough briefing on the fine art of locating and identifying antique bottles, we pulled on our wetsuits and loaded the boat. Diving Bridgetown is convenient because a short trip in even the slowest vessel will put you over a site with good potential for collecting. A five minute ride brought us



**Bridgetown Harbor, Barbados, where divers found old bottles and new scotch (opposite).**

to a 40 foot deep area that looked like it would have been a choice anchorage for the many ancient sailing vessels that had frequented this port since the Portuguese discovered it in 1536. Over the centuries, many notable historic figures have come here by ship, including George Washington in 1751. Our imaginations ran rampant with expectations of what we might find below.

A leisurely descent put us on the sandy bottom. Visibility was excellent considering the position of the late afternoon sun and the turbidity of the water caused by a hurricane that had passed through only days before. Shapes of bottles covered with sand and coral were everywhere.

Our buddy teams spread out and began to fan every prospect in sight. Most of our finds were bottles of recent vintage but we constantly turned up bits of genuine antiques, obvious from their rough seams and crude necks. Every now and then the other divers could be seen waving an intact old bottle for their buddies and the rest of us to admire and envy.

Even at this shallow depth, our feverish activity quickly burned off the air in our 80 cubic foot cylinders. Long before we were ready to abandon our exploration, the 500 psi readings on our pressure gauges signaled the end of our adventure and the start of our ascent to the boat, where we could examine and compare our finds.

While we were excitedly reliving our experiences and comparing our discoveries, Jerry finally popped to the surface. When we asked about his luck and where he had been so long, he grinned and casually remarked that he had found something better than our empty bottles—he



had found full ones! To our amazement, he reached inside his BC and produced a squarish, clear glass bottle full of amber liquid. A quick examination of the 20th century, aluminum screw cap markings revealed that it was an intact bottle of Johnnie Walker Red Label scotch. Jerry described how he had found two large, mysterious looking, plastic-covered bales down below and cut one open with his knife. Out spilled dozens of bottles of imported scotch!

Suddenly, everyone was pulling on BCs and checking their remaining air pressure. Before we could get back into the water, our divemaster halted our plans. Rather than allow us to risk a



bounce dive on residual air to recover the treasure that waited below, he directed us to take a position bearing on the shore so we could return.

Speculation ran wild during our trip back to the dive shop. Where had these bales come from? To whom did they belong? Were there more still to be found?

We hauled our cylinders ashore for air fills and began to assess the situation. Finding bales full of liquor bottles, with no customs duty markings, near the main docks of the harbor suggested one very intriguing and plausible explanation to our mystery. We had found the cargo of island smugglers who must have been forced to abandon it overboard when a Barbados Customs Service boat got too close for comfort. None of us knew what Admiralty Salvage Laws applied in such a situation but a quick "quality check" on our sample reinforced our decision to return as rapidly as possible to complete our recovery efforts. Then, someone suggested that the smugglers who had jettisoned this "liquid gold" might still be watching for a chance to recover it.

The atmosphere became charged with excitement as we considered the possibility of unseen eyes watching the harbor for anyone recovering this contraband. We had no desire to tangle with armed cutthroats but the adventure had become too good to resist. Casual talk was put aside as we made our salvage plans with military precision.

With the sun low on the horizon, we waded back into the ocean with our fresh tanks. Darald, Jerry, our divemaster and I motored out to where we had taken bearings on the shore. Once in position, the three of us quietly slipped over the

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## BOTTLED BOOTY

side while our guide continued on with the boat to distract any possible attention from interested observers in the area.

We quickly descended to the bottom. Our compass work was spot-on as we settled down directly over the two bales of scotch we had been forced to abandon earlier. Following our plan, I stayed with the bales while Jerry and Darald swam compass search patterns in the area to check for any other possible cargo. I watched them disappear into the increasing gloom as night approached and suddenly began to feel very alone.


It seemed like an eternity had passed before I saw Jerry's form struggling along the bottom with another bale identical to the two I was guarding. Almost simultaneously, Darald appeared from another direction dragging two more. We gathered our salvage together, checked our air pressure and nodded to each other to acknowledge that it was time to end our search. In the rapidly fading light, our keen-eyed divemaster spotted my bubbles and quickly brought the boat next to me as I handed up the first bale. Now, with night almost upon us, I descended to help Darald and Jerry raise the other four bales to the surface.

As we pulled ourselves onto the boat, darkness had settled over Bridgetown Harbour. Covering the bales with our BCs and cylinders, we hoped that when we reached shore we would look like an ordinary group of night divers.

The beach was deserted as we landed our small boat. A few trusted Barbadian natives waded out to meet us and to lug our equipment and cargo ashore.

Back in the privacy of the dive shop we tore open the bales. Each contained two full cases of Johnnie Walker Red, a total of 120 bottles. By now, the scene resembled a liquor warehouse more than a sport diving center. Our thoughtful divemaster quickly produced some drinking glasses and dispatched one of the native boys, who returned minutes later with a sack of ice cubes and bowl of conch fritters. There was no lack of beverages the remainder of that evening as we celebrated our find and toasted Christmas with our supply of scotch.

All too soon, we had to return to our ship to continue our cruise. Without any legal expertise to guide us with salvage laws, our find was split among the divers. We could hardly manage the weight of our gear bags as we boarded our ship that night.

At home, amidst our artifacts, sits one last bottle of Johnnie Walker with the remains of a tattered salt-stained label. This scotch will never be consumed but will always serve as a reminder of an exciting day spent in the Caribbean salvaging Christmas gifts from the sea. 

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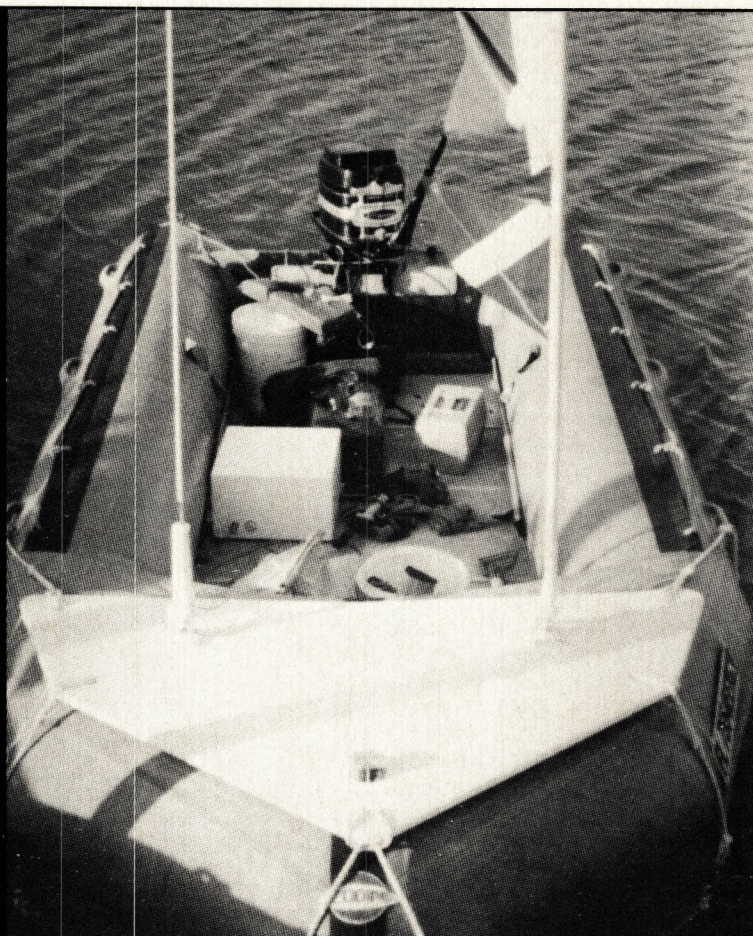
# Rigging Inflatables For Precision Diving

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BY MICHAEL JOYCE

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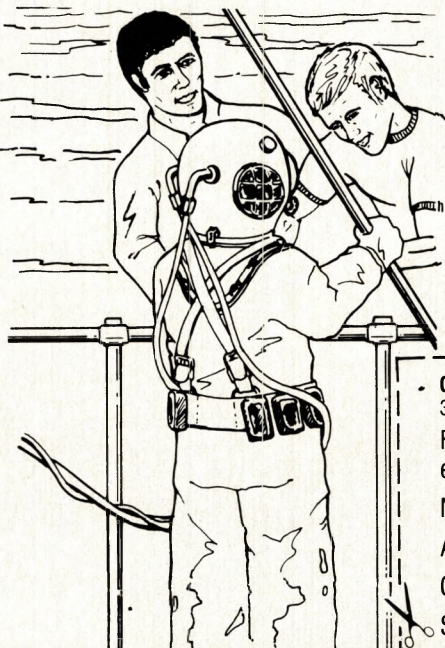


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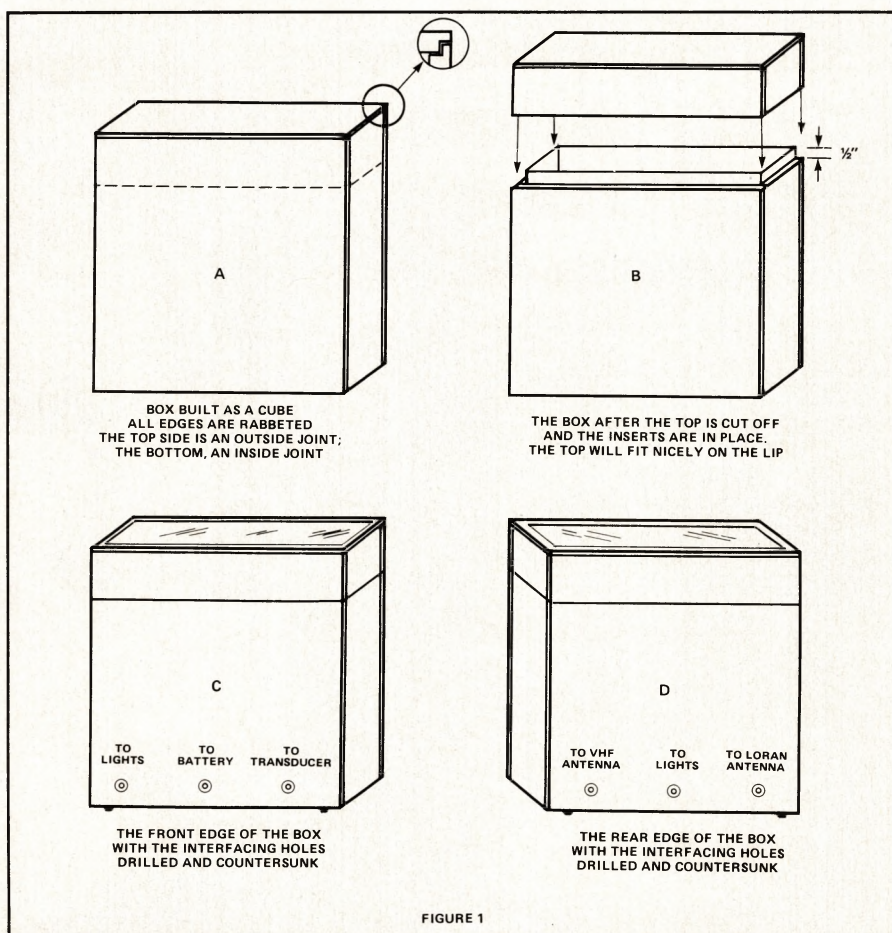


## RIGGING INFLATABLES

the spots. For roughly \$1,000 the careful shopper can buy a Loran C, a depth chart recorder and a VHF radio. You may ask, "In an inflatable?—you're kidding!"

It is possible, but several problems must be addressed in our design: Interference radiating from the outboard can degrade the system; the recorder transducer can cavitate; the Loran C antenna must be at least eight feet from the unit; and all assemblies must be as portable as the boat. The following solution neatly handles these problems and, as a bonus, solves three others!

The heart of the system is the electronics box. This houses all the electronics and serves as the main distribution terminal for the electricity. The size of the box depends on the size and amount of the electronics. Figure 1 is an exploded view of the box. Pine plywood,  $\frac{1}{2}$  inch thick, is used. The box is first built as a cube, using lots of waterproof wood glue and 4d galvanized finishing nails. After the glue dries, draw a line around the sides of the cube, down two inches from the designated top, and cut the cube along this line. By building the box in this manner, the top is made to the exact dimensions. Using  $\frac{1}{4}$  or  $\frac{3}{16}$  inch plywood, build a box liner to extend  $\frac{1}{2}$  inch above the sides of



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the main box. This will provide a lip for the top. Fill all cracks and voids with wood putty. When the putty has cured, sand the entire box inside and out, rounding off the outside corners.

Now is the time to drill all holes for mounting brackets, cables and terminal strips. Instead of using wood screws, I used stainless 8-32 bolts and nuts, countersinking them on the outside. Don't forget the rubber feet! (I did.)

Use a wood preservative, liberally applying it until the wood will not absorb any more. Paint the box with a minimum of three coats of a marine enamel. White is a good cool color. Lightly sand between coats and let each dry thoroughly before applying the next. Some may want to use a marine varnish, especially if a good job was done building the box. In the sun, varnish tends to cloud and may require more frequent touch-ups.

Figure 2 is a typical wiring diagram to stimulate your imagination. Every system will be different; however, some simple rules will apply to all:

Use red jacketed 18 gauge copper wire for the positive side and black for the negative side.

For a neat look, run all wire parallel to the edges, with 90 degree bends.

Use tie wraps (available from Radio Shack) every two inches.

Use polarizing connectors to avoid expensive "cockpit errors."

Do the neatest job possible (electricians say neat jobs work better).

Provide two electrical outputs for powering lights.

The box lid can either be hinged or set up to pull off when necessary. After I built mine, a dive buddy suggested putting a plexiglass window in the top so the Loran C and recorder could be read, yet be protected from sea spray, rain, etc.

The antennas are mounted on a bow platform, fabricated from 5/8 inch plywood. Refer to Figure 3. The bow of the inflatable is measured to make a pattern. Note that the bows of most inflatables comprise several angles instead of smooth curves. This simplifies the platform design since you can use several short straight cuts, instead of long curved cuts. Design your platform to protrude even with the rubbing strake, but not exceed it. Attach the platform to the boat by tying it to any available D-ring or lifting handle, using short lengths of 1/2 inch nylon line. Use your best marlinspike seamanship to tie a convenient bight (that's a loop to landlubbers) in one end of each line. I used five different tie points, but three should be sufficient. Drill one inch diameter holes one inch from the edge nearest the tie point (hole edge to platform edge). A router with a "quarter-round" bit does a nice job rounding all platform edges.

The VHF and Loran C antennae are mounted to the platform using nylon ratchet mounts. Use countersunk 10-24 stainless bolts and nuts. Mount a bow

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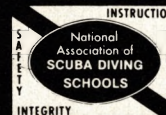
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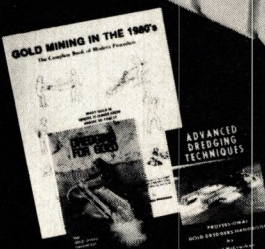


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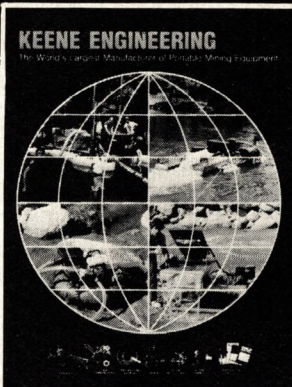
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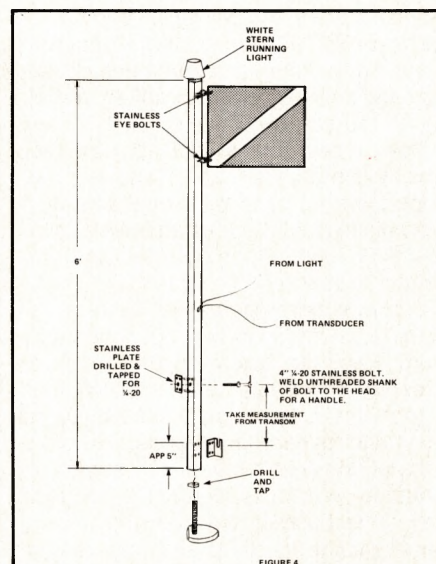
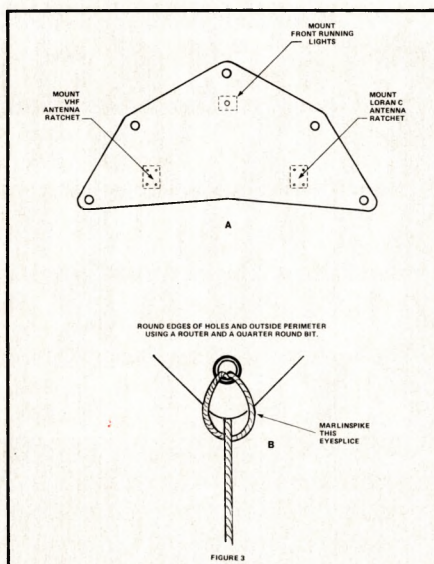
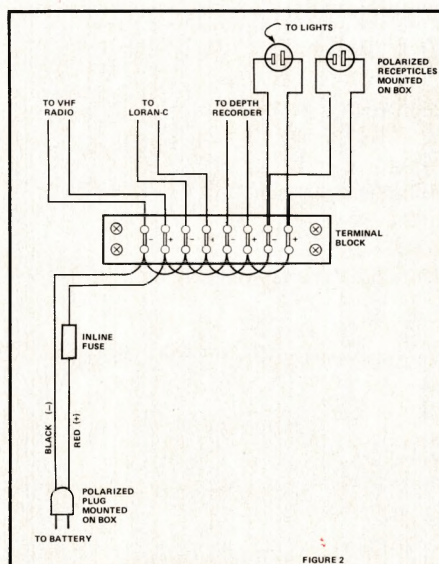
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## RIGGING INFLATABLES

running light fixture (first bonus) on the platform near the forward edge. Have all wires protrude from the bottom side of the platform. This will simplify running them along the bottom of one of the pontoons, out of the way. Boat registration plates can also be mounted on the platform (second bonus).

Depth chart recorder transducers

come in two different styles. The first style mounts on the transom. There are two disadvantages to using this style. First, it must be screwed to the transom and that is much too permanent for most inflatable owners. Second, when inflatables plane, the transom may be entirely out of the water. This causes the transducer to cavitate and, of course, work improperly.

The desired style transducer is the "thru hull" model with a pointed body and a threaded shaft. Figure 4 depicts the transducer assembly. This assembly fits

in the keeper provided on most inflatables for launching wheels. The shaft is a six foot rod of 1 1/4 inch aluminum square tubing. This stock can be ordered from most hardware stores. The lower end has a plug cut from a piece of 1/2 inch aluminum plate. Drill and tap the center of this plug to accommodate the threaded shaft of the transducer. The plug can be machined to provide a press fit or may be heliarced to the assembly shaft. Make a bracket to fit the launching wheel keeper from scrap angle stock and rivet it to the

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


assembly shaft. This bracket is positioned so that the transducer will be level with the bottom of the pontoons. Drill a hole through the assembly shaft for the upper keeper bolt. Rivet a stainless plate over the outside hole, and drill and tap to accommodate the upper keeper bolt. Study the design of your launching wheels to get a better understanding of what's going on.

Mount two stainless eyebolts at the top end of the assembly shaft to mount your dive flag (third bonus). A white stern running light is mounted at the top (part of the first bonus). All wires are fed through a hole in the assembly shaft just above the transom line.

Power is taken directly from the motor battery terminals. If your motor is a manual start only, it may have an alternator. A 12 volt motorcycle-sized battery will work just fine, charged by this alternator.

Most of the work described here can be done with small hand tools. Improvise where necessary. Almost all of us have a friend with a lathe in his workshop that would help out. I've found that by "selling lobster futures" friends become very helpful! The entire project can be completed in a couple of winter weekends and would be a great excuse to invite your favorite dive buddies to help. Since no changes are made to the boat itself, the resale value is not impaired.


This exercise has been delightfully educational for me. It's also been fun sharing it with you. I couldn't have done it without the efforts of Jeanette Keen, who provided the illustrations. 

## JOLSONFISH


During a recent visit to Grand Cayman, comedian/art collector Jonathan Winters was presented with a signed print of a Don Foster photo. Don and Jil, of Don



Foster's Dive Grand Cayman, made the presentation in honor of Winters' distinguished show business career and to show what the entertainer missed during his non-diving vacation on the island.

On first viewing the print, of a French angelfish, Winters jokingly titled it "Fish Mimicking Al Jolson at One Fathom." 

## ISLAND FANTASY BASE

In the July SDM table of contents the dive cruiser *Island Fantasy* was described as Ft. Lauderdale-based. The 90 foot vessel is actually based in Riviera Beach, Florida—just north of West Palm Beach. 

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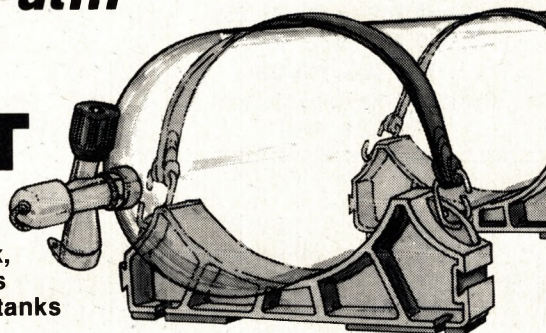
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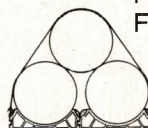
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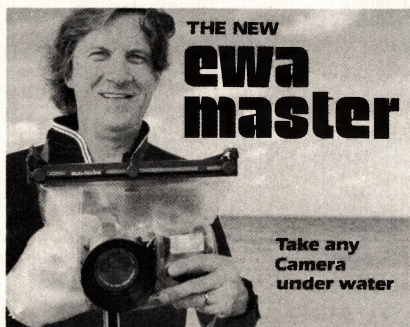
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## Flip Schulke

author of "Underwater Photography for Everyone"



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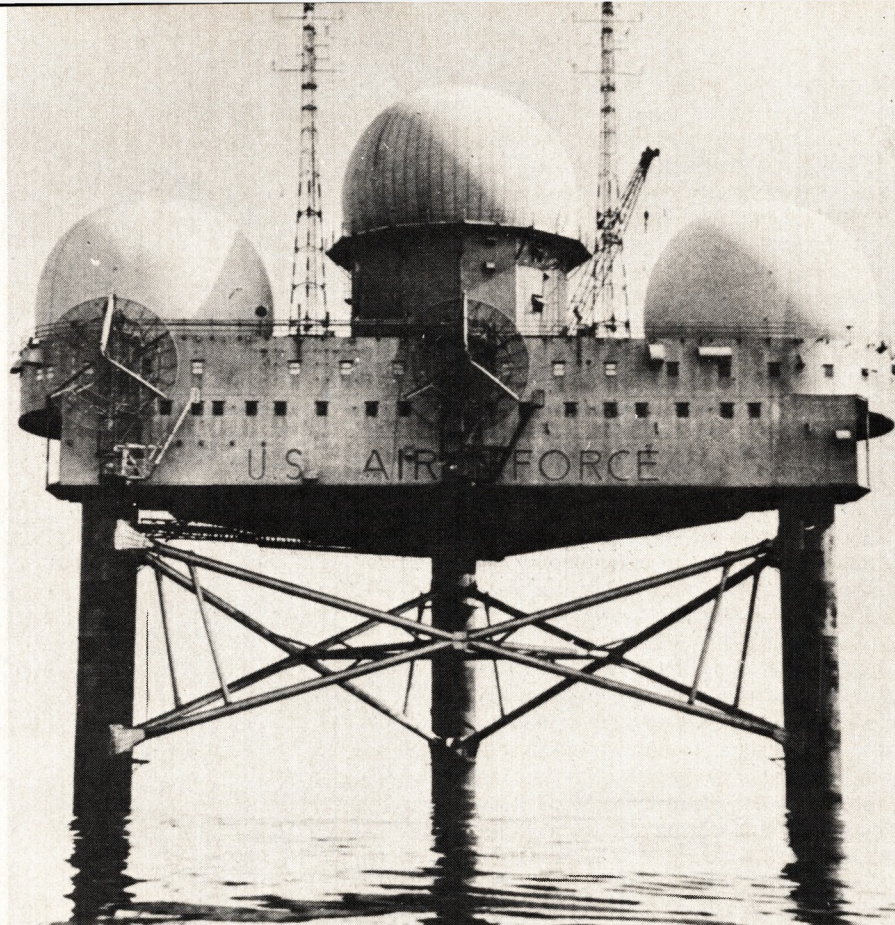
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# Texas Tower #4

## Radar Platform Tragedy Creates Unique Dive Site

TEXT AND PHOTOGRAPHY BY CHUCK ZIMMARO

Approximately 70 miles due east of Barnegat, New Jersey, lie the remains of an endeavor, an endeavor in national security systems. It had worked successfully in two other locations, one off Cape Cod and the other on the shoal on George's Bank. However, off the coast of New Jersey, it would prove disastrous and cost 28 men their lives.

This is the story of Texas Tower #4—then and now.

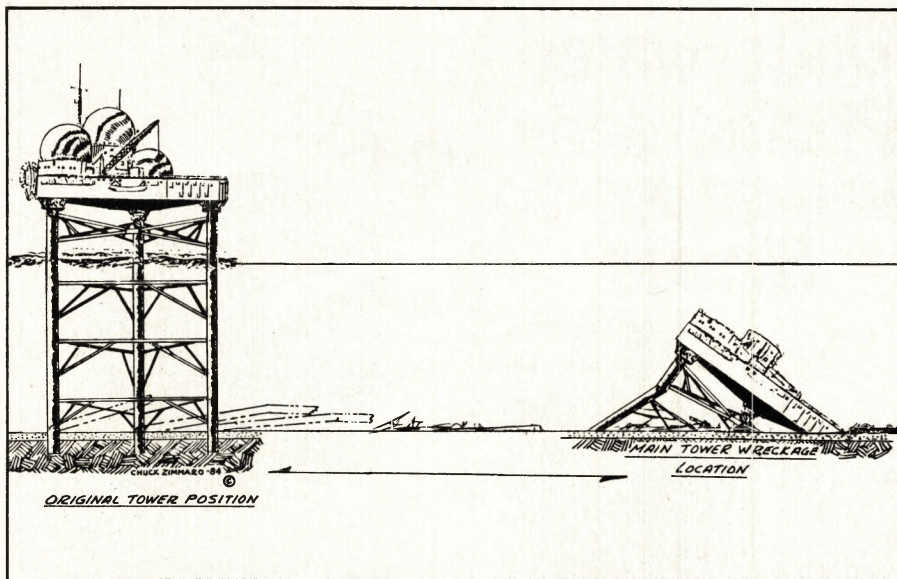
### THEN

The Air Force called them Texas Towers because they were similar to the offshore oil rigs in the Gulf of Mexico, off Texas. They were actually early warning radar stations that guarded the air and sea approaches of the eastern United States. Tower #4 was a large triangular shaped platform, 187 feet long on each side and 67 feet high. The lower deck housed all of the power generating equipment and the pumps supplying all of the electricity, water, heat, etc. The second

or middle deck housed the crew of 65 enlisted men and eight officers. The recreational facilities consisted of a woodworking shop, electronics hobby shop, ceramics shop, gymnasium, large rec room and a large mess hall. On the upper level were the computer rooms, electronic stations and the extremely powerful and sensitive radar—both rotating and stationary. The normal tour of duty was 16 months. The crewmen would spend 45 days on the tower and 15 days on shore leave. This pattern would be repeated for the 16 month tour and then the crewmen would be transferred to a less isolated post. The pay was good—up to \$400 a week for some of the men.

Texas Tower #4 was part of the 4604th Squadron of the U.S./Canadian Air Defense warning system, weighing 4,000 tons and supported by 12 foot diameter hollow legs. Each leg was made out of 13/16 inch steel plate and was 310 feet long, weighing 1,800 tons. The water depth was 187 feet and the ocean bottom





Illustrations/Chuck Zimmareo

the Navy officers on board the support vessels agreed the damage could be repaired on location. So, the divers set about fabricating a heavy steel collar to replace the torn braces and repaired the damaged one.

After TT #4 was in operation, civilian commercial divers were contracted to inspect the legs periodically. They reported that seas pounding against the hollow legs had loosened the heavy collar. It was sliding back and forth in the strong current. New braces costing nearly \$500,000 were ordered and installed above the waterline, in hopes of cutting down on the tower's gyrating motion. TT #4's crew called her "Old Shaky."

In September of 1960 Hurricane Donna severely battered the tower with seas over 60 feet high and winds over 120 miles per hour.

In November of 1960, the pitching and rolling motion of TT #4 was so bad that the commanding officer, Captain Gordon Phelan, noted in the tower's logbook, "Have been in contact with [squadron commander Major William R.] Sheppard all morning. Tower condition becoming hazardous to life. Recommend partial evacuation." All onboard except for 14 servicemen and 13 civilian construction workers were taken off the tower.

After heavy storms during the month of December, civilian welder Vince Brown

(Continued on Page 94)

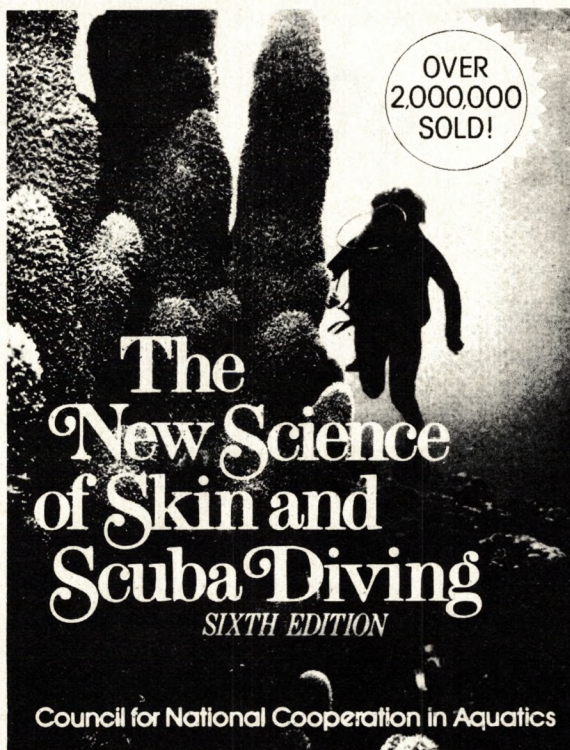
wasn't the best to support a tower. It was a mixture of sand and mud. Texas Tower #4 was on a shoal a mere 12 miles from the continental shelf.

In 1957 the tower was constructed in a shipyard in Portland, Maine, at a cost of \$21 million, and then towed 500 miles. While the tower was being placed in position on the bottom at its new home, a heavy storm moved into the area. All through the night and the next day, the

tugs struggled to hold the tower in position. There was even fear that the tow lines might part and the tower would crash to the bottom. However, the storm finally died and divers were called in to assess the damage.

When the divers returned to the surface, they reported that several large steel braces on two of the legs had been torn loose and a third brace was severely damaged. The civilian contractors and

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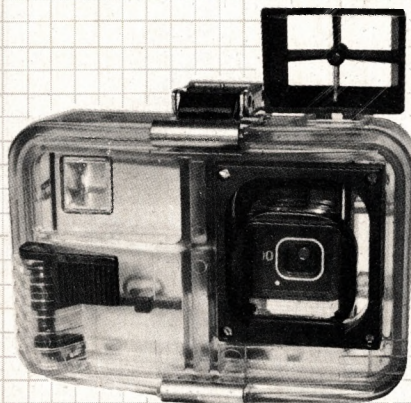
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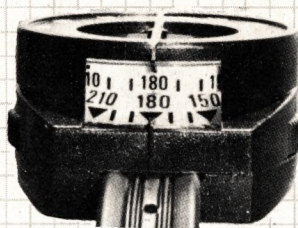
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# SDM travel

## SECTION

### BRAC REEF RESORT

#### A Peek at the Other Side of Cayman

TEXT AND PHOTOGRAPHY  
BY BARBARA A. CURRIE

Where else in the world can you find an island where: doubloons are so common they're accepted as legal tender; topside and offshore caves might still sequester pirate treasure; a small beach resort offers access to miles of untouched reef and walls? And, all of this just minutes from a small airport where visitors arrive by 727 three times each week.

I'm not a victim of rock fever. This special island has real geographic coordinates. It's a rugged little gem called Cayman Brac, whose 14 square miles rest 85 miles off Grand Cayman. The simple resort offerings have been polished and the island's newest hotel, the Brac Reef Beach Resort, is as charming and casual as the Brac itself. But the quality of facilities and service you'll find here places this 42 room resort among the best out island hotels in the Caribbean.

Of the Cayman trio, Grand Cayman gleans most of the country's promotional efforts. Cayman Brac, with 1,700 people, and Little Cayman, with about 70, are the quiet sister islands, for some time reached only by a 17 passenger Britten Norman trislander via Cayman Airways. The small plane still makes almost daily runs from Grand Cayman, but the completion of the Gerrard Smith Airport's 6,000 foot runway last year made the Brac accessible by the national flag carrier's 727 service from Miami. Divers and



Brac Reef Resort offers 42 comfortably appointed rooms, on the beach. The freshwater swimming pool provides a relaxing alternative to diving. Above left: Denise McDermot and angelfish. Above right: Brac Reef dock and dive boat.

their bags can now arrive on the same flight, in a comfortable style, at the island's small airport, which has also had a major facelift in the past year.

Add to those improvements the availability of quality resort facilities and a full service dive operation and you have the ingredients necessary for disciples of Cayman diving to discover this country's out island underwater frontier—without roughing it.

When I packed my gear in July and hopped the Cayman Airways 727 to go back to the Brac, it was at the insistence of long-time friends Winston and Denise McDermot, whose Brac Aquatics Ltd. dive operation is the oldest established watersports business on the island. I hadn't been underwater off

Cayman Brac in more than two years and needed to renew that friendship—and others, including one with Linton Tibbetts, the godfather of tourism in Cayman's sister islands. His 42 room Brac Reef Beach Resort opened last year and ranks among the finest small hotels I've found in the Caribbean.

Tibbetts has added a milestone in amenities on this tiny island: a large reverse osmosis desalination plant that supplies not only the Brac Reef Beach with plentiful fresh water but serves the island with its surplus.

The Brac, with its backbone of a limestone ridge rising from the west to a dramatic 140 foot bluff (Brac is Gaelic for bluff) at its eastern tip, is the most beautiful of the Cayman trio. The



# travel

sense of mystery and adventure inspired by this rugged landscape is part legend of pirate treasure and part pure folklore about duppies (island ghosts) who guard it in the intricate system of caves that thread through the interior of the island. But doubloons used as legal tender is a true offbeat tale created when the Brac Reef Beach Resort opened.

Guests at the resort must purchase pouches of gold-colored coins to pay for all drinks at the beachfront Channel Lounge Bar. During the past year, indicative of the laid-back Bracker atmosphere and casual attitude of its 1,700 inhabitants, patrons carried away unspent doubloons. Local establishments accepted the 50¢ and \$1 pieces as currency, knowing, naturally, they could be cashed in at the Brac Reef Beach for Cayman dollars.

The Brac Reef Beach Resort is anything but a rustic dive lodge. Each room is furnished with two double beds, an air conditioning unit and a ceiling fan and finished with a bright tropical decor. The 42 rooms lie just west of the main building. This is equally attractive with its mahogany doors hand carved by local craftsmen. These are an impressive introduction to the lobby, conference room, Coral Gardens Dining Room and Channel Lounge Bar and adjacent beauty salon and gift shop.

An all-Bracker staff means the friendly atmosphere long a trademark of this island permeates the resort itself. And, the Brackers' reputations as superb seafood cooks prove true at meals in the Coral Gardens room—and during weekly barbecues and fresh fish cookouts on the patio.

The Brac Reef Beach staff can create as many activities as guests want—both onshore and offshore. Although the tennis courts are still on the drawing board, a freshwater pool set in a sand garden by the main building provides a lazy alternative to either diving or bonefishing in the shallows directly off the resort. Island tours, cave exploration trips, picnics and weekend dances with local bands are other options.

Brac Aquatics Ltd. was established in 1977 and Winston, Denise and their staff of nine divemasters have worked hard not only to promote the Brac as

an outstanding dive destination but also to protect the Brac's reefs from damage over the years.

The dive shop is on the Brac Reef Beach premises, right next to the dock and channel through which Winston's fleet passes to reach some 35 regularly visited dive sites. Divers are accommodated on three custom boats. These 32, 44 and 48 foot open V-hulls were designed for diving areas like the Brac, where the sea can be choppy sometimes. Morning two tank dives depart at 9:00, and afternoon one tank trips at 3:00.

Winston was quick to point out that this is very different diving from Grand Cayman's predictably lakelike west coast, which attracts the majority of this country's tourist trade. Depending on the time of year, either the north or



**Winston and Denise McDermot established Brac Aquatics, Ltd. in 1977.**

the south coast is normally flat off Cayman Brac, but year-round diving from flat-tops is impractical. Boats have to pass through the channel in the south coast reef, which is the only protected mooring, and the wind can kick up and make the ride rougher than a small flat-top can take. That's why Brac Aquatics uses the plain V-hull design and consequently, divers can expect to dive year-round, despite a choppy south coast. In the past four years, Winston said, they have never been weathered in. There is little current out here and many outstanding dive sites are as close as immediately outside the channel by the Brac Reef Beach.

This is not a regimented, dive by numbers operation. Winston's staff of nine divemasters and one PADI instructor try to provide guests with the best diving possible on a day-by-day basis. With one exception, his staff members are Brackers who have

years of diving experience in their home waters and consider themselves a team rather than employees. Where the dive boats go each day depends on their assessment of conditions, with best visibility a top priority. Customers' requests for specific sites are honored whenever possible.

We had hoped to make the 40 mile round-trip all-day odyssey to Bloody Bay on Little Cayman's legendary north coast, where the wall begins as shallow as 20 feet and is praised as the finest area in the Caribbean. But the tradewinds became more than gentle eight knot coolers that weekend and less-than-sturdy seafarers would have been uncomfortable. That's something many people fail to understand about Brac Aquatics' operation, which goes to Little Cayman when diver interest and weather conditions permit: They simply can't guarantee divers that experience during their stay.

Instead, we opted for some nearby sites, which proved stunning discoveries I'd missed on previous trips. With us was Ed Beaty, a professional photographer and the photo pro with Brac Photographics Ltd., a complete underwater photo facility that shares space with Brac Aquatics in the dive shop. Ed's service has existed since 1984.

We made a short, 10 minute run around the western tip of the Brac to Airport Wall, just off the runway's edge. It was a wildly colorful site, where the wall, at 65 feet, was thick with deep water gorgonians and confetti-collections of sponges. The top of the wall was a forest of sea plumes and whips, clusters of tube sponges, patrolled by almost aggressively curious French angels and reef fish.

Visibility averaged 150-200 feet, perfect for hanging off walls and staying mesmerized by panoramas of sea-space. That dive, Winston reminded me, was typical of the wall dives that are the main attraction on the Brac.

Other underwater highlights we sampled on successive dives included huge basket sponges at West Chute and an 85 foot tugboat sunk two years ago off the north coast, incredible carpets of macro life beneath some fine towers of pillar coral and two anchor sites.

Anchor Dive lies 400 yards beyond the dock. There, an old anchor is wedged in a coral crevasse, with the fluke bottom resting in exactly 100 feet. The 10 foot anchor is marked by a large coil of chain on the wall ledge, near it is a tree of black coral.

East Chute, on the north coast  
(Continued on Page 112)



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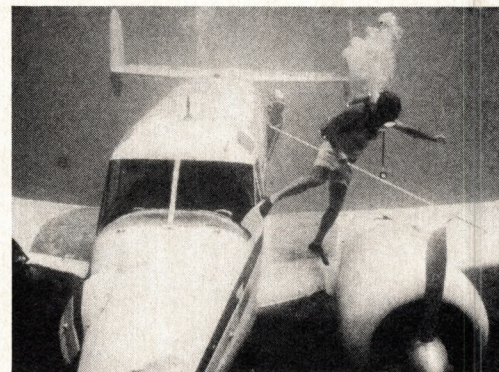
# CURACAO

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## Let's Dive The Airplane



photos/James R. Robinson

### Sunken Beechcraft Becomes Kona Coast Artificial Reef

BY DICK DRESIE

**T**he phone rang about 7:30 one recent evening and Jim Robinson said, "Hi Dick! We've got space for one more tomorrow morning. Do you want to dive the Airplane?" My immediate response was, "You bet!"

Jim owns Kona Coast Skin Diver, Ltd., in Kailua-Kona, on the big island of Hawaii, and runs a charter dive boat all along the beautiful Kona Coast. The Airplane Jim referred to is a plane wreck, up

the coast from Kailua-Kona, that had gone down on a sightseeing tour in September of 1983. We had explored the wreckage shortly after it sank and were anxious to see how it had weathered the elements in the year or so since it became a popular dive site.

The twin engine Beechcraft had lost an engine on take-off (with ten people aboard) and had to ditch in about 25 feet of water. Fortunately, with the aid of a

fishing boat nearby and a fire-rescue boat on maneuvers in the area, all on board were saved. The insurance people attempted to salvage the craft, but to no avail. Jim wrote to the insurance company and asked if Kona Coast Skin Diver, Ltd., could attempt a salvage. They responded with their approval and Jim, with help from other Kona divers, lifted the plane (using huge air bags), moved it farther offshore and sank the wreckage in



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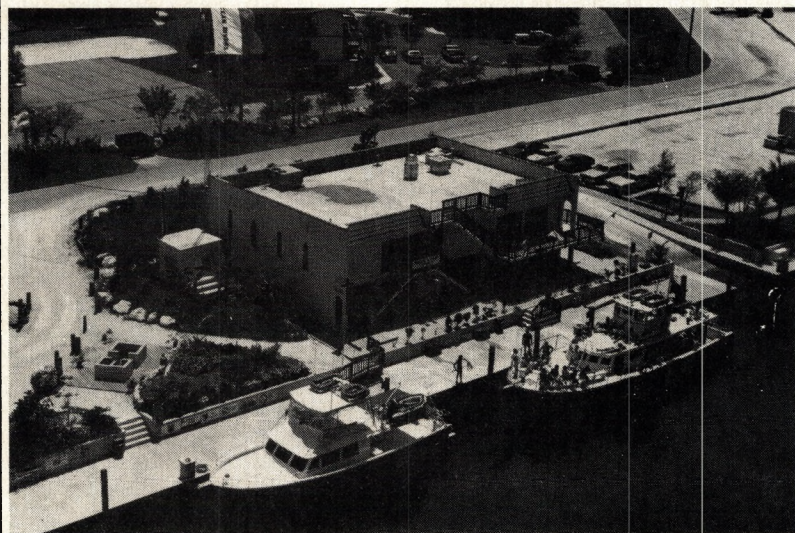
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## THE AIRPLANE

100 feet of water. At that depth, Jim felt, in Kona's calm waters, the plane would remain intact—serving as an artificial reef as well as become an excellent dive site. Jim's feeling has proven correct and divers from all over the world are enjoying the Airplane off Kona.

The next morning dawned clear and cool and when I looked out my lanai window the ocean looked flat and inviting (normal for this leeward side of the island). The plan was to meet at Jim's shop, then head for the pier in Kailua Bay, where he moors his 26 foot Radon custom built dive boat, *Skin Diver I*. After checking in, meeting the other six divers and clearing the paperwork, we headed for the pier. Ron Peppler, an experienced captain, scuba instructor, and divemaster, would be our skipper.

The sea was flat so the run up the coast was short and smooth. Only 25 minutes from the pier found Ron maneuvering the boat to the spot where the anchor would drop 100 feet to the ocean floor. The surface of the water was like glass, so rather than using the viewing ports in the hull of *Skin Diver I*, we could simply look over the side and make out the distinctive outline of the plane below. Keep in mind, we were looking through 100 feet of water, from the surface, and yet the plane was spectacularly visible! As we donned our gear, Captain Peppler instructed us on currents, depth, bottom time, what to expect at 100 feet, etc..

We all entered the ocean together (enjoying the 76°F water) and used the anchorline to descend. We arrived in a group and were astounded by the clarity of the water, the lack of surge and the beauty of the plane as it rested right-side up on the bottom of the Pacific. It was kind of an eerie sight.

Two beautiful, reddish-gray squirrelfish have taken up residence in the fuselage and have become quite tame. Each is large for that species. Ron brought some fresh squid in a concealed plastic bag and as soon as we arrived, he began feeding the *u'u kane pou* (as they are known in Hawaiian terms) by hand. Several other smaller reef fishes have discovered the plane and are now schooling around it. Invertebrates are numerous around, in and under the plane, as well, so Jim's hope that it would become an artificial reef is certainly becoming a reality. The plane is a photographer's delight. The brightness of the water at that depth allows available light photos, while flash fill can also be useful.

Too soon Ron signaled that our bottom time was up and we had to make our ascent. As we started up the anchorline, each of us kept glancing back at what had become "our airplane" for one last glimpse of a very exciting addition to Kona's many fantastic dive experiences.

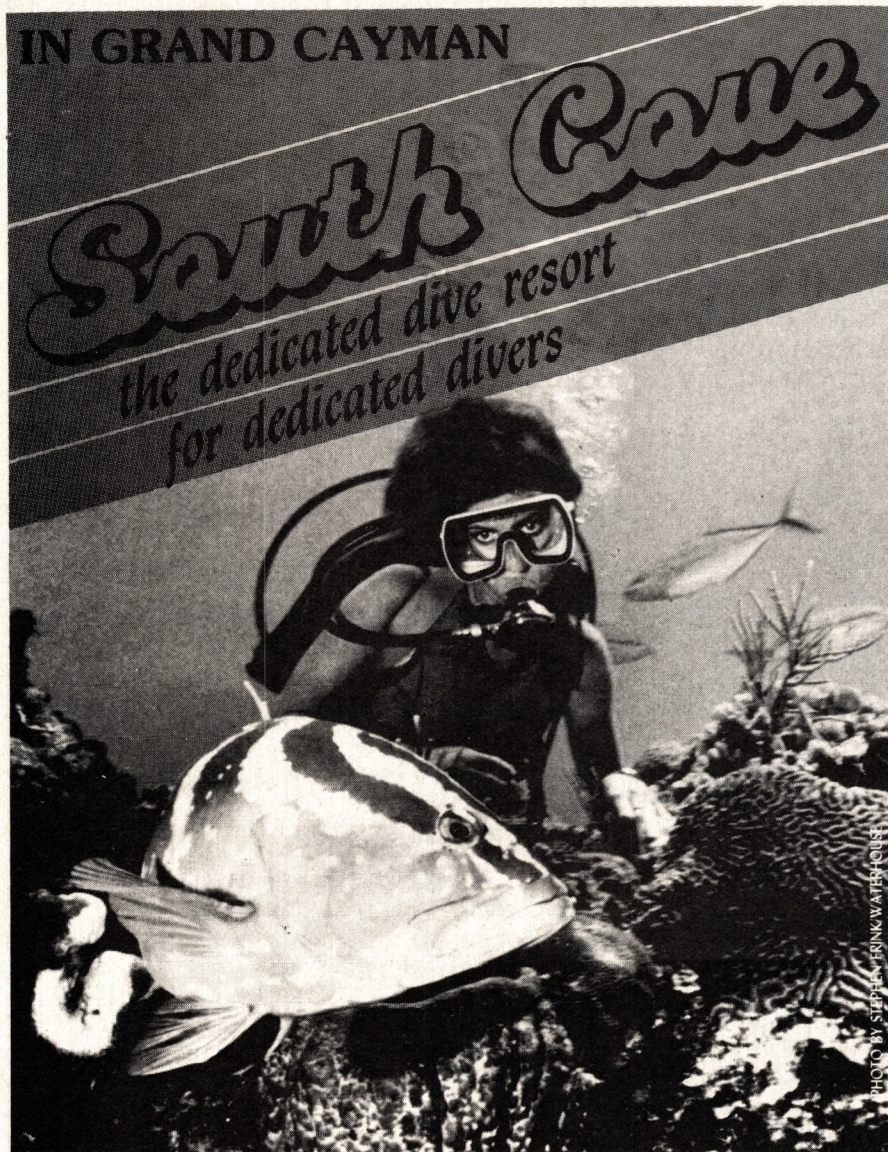


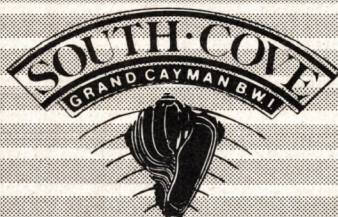
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# Live Treasure:

## Starting a Saltwater Aquarium

BY GEORGE A. BRANDT

For most divers the urge to pillage the ocean to varying degrees borders on instinct. As we roam the underwater world, we constantly seek the elusive treasures of the sea whether it be a shell, a prize winning fish or a colorful photograph. The goodie bag is usually considered a standard piece of gear and rarely does a diver surface with it empty. Its contents are proudly displayed on the mantel at home, contributing to an impressive assortment of exotic mementoes from past dives.

Aside from the usual shells, corals and skeletons, there is another treasure that is perhaps the most elusive of all, but ultimately much more rewarding: the saltwater tropical fish. While the thought of returning with a live specimen has occurred to most divers, it is often dismissed as

being too difficult to accomplish without a degree in marine biology, not to mention costly.

In truth, it has only recently become feasible for those who live more than a few miles from the coast to keep a saltwater aquarium in the home, thanks to the development of artificial seawater. It contains the same complex mixture of trace minerals and ions as the real thing. Today, these synthetic mixtures have been refined and made more affordable than ever, owing to the growing popularity of the hobby. Although it has become relatively simple to maintain a saltwater aquarium, there are a few basic facts and procedures you should be aware of before your first collecting expedition.

Begin by first setting up the aquarium and having it properly conditioned and

ready to contain its first fish. Start off with at least a 20 gallon, all glass tank. Besides the tank itself, you will need:

Natural coral sand: Avoid dolomite gravel, which contains lead and minerals that will slowly poison the aquarium.

Undergravel filter: Combined with sand, this provides the biological filter of the aquarium and essential aeration.

Air pump and plastic tubing

Thermometer

Heater (optional in some cases)

Natural coral and/or rocks: Besides adding depth and color to the aquarium, it is important the fish have shelter. The best possible simulation of their natural environment is the key.

Synthetic sea water

Hydrometer, PH and nitrite test kits: To measure specific gravity, PH and nitrite content of the water.

Fluorescent light: Simulates sunlight, allowing plants and algae to grow.

Setting up the aquarium, put the undergravel filter on the bottom of the tank and spread the coral sand on the top, using one pound per gallon measurement of the tank itself. It is often necessary to first clean the sand by running water through it. Next, place the decorative rocks and coral inside and fill the tank with water. Connect the air pump to the filter with the plastic tubing, and start the air circulating.

Now the salt mixture may be added. It

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## LIVE TREASURE

will be circulated through the filter until it is dissolved. Add the amount required for the actual amount of water. Wait six hours for it to dissolve, then check the specific gravity with the hydrometer. Ideally, it should read between 1.021 and 1.022. Adjust accordingly and remember, it is always easier to add more salt than dilute the water.

If the operation is in a room that is constantly kept warm, a heater may be optional, but advisable nonetheless, as it ensures keeping a constant temperature. (This is for tropical fish; to keep cold water fish you will probably need an aquarium cooler of some sort.) Most fish experience seasonal changes in temperature and can tolerate gradual changes. Sudden changes, however, may throw them into shock.

PH is not an item of concern when first setting up the aquarium, as the salt mixture contains certain buffers that will regulate it, keeping it toward the alkaline range. As the tank ages, however, you will need to check it more often.

Finally comes the actual conditioning of the water. At this stage, the aquarium is a sterile environment incapable of sustaining marine life for any amount of time, as it is still lacking the nitrifying bacteria essential for breaking down ammonia, the toxic chemical result of the waste put out by aquatic animals.

It is therefore necessary to introduce some bacteria to the aquarium before adding any fish. There are conditioning solutions on the market that contain these bacteria, but the cheapest and most reliable method is to simply obtain a bacteria sample in the form of a small amount of gravel and water from an already established aquarium. After 24 hours, the aquarium will now be ready to contain *one* fish. The bacteria will need time to reproduce and grow before more may be added without the building up a toxic level of nitrite. This cycle usually takes three to four weeks.

The next step is to plan the collecting dive. Look around at the pet shops and get a general idea of which fish will do best in the new aquarium. Gobies, wrasses and damsels are all extremely hardy and can tolerate low concentrations of nitrite much better than such fishes as angels or butterflies. Smaller specimens are easier to catch and will adapt more readily to the confines of the tank.

Various collection techniques may be used and at first they will all require a great deal of patience and practice. The simplest to start off with may be the slurp gun. It is most effective when the fish has found shelter in a crevice, where it may be sucked out into the gun.

Other techniques include the use of nets and collecting jars and with a little ingenuity, one may assemble a trap with



screen wire or mesh cloth. To obtain the best results, crush a sea urchin or other shellfish inside the trap and wait behind a rock until it has attracted enough hungry visitors. With some fishing line, close the trap and haul it topside, where the prize specimens may be selected in a holding tank. It sounds deceptively simple, but plan on putting in some long hours at first. It is not a good idea to collect in deep water, as the delicate swim bladders in many fish will often embolize if they are brought up too quickly.

These methods, although not the simplest, are the safest and least damaging to the underwater environment. Forget about using the chemicals used in commercial collecting. While they are often given such euphemisms as drugs and sedatives, they are nothing more than poisons that will cause permanent damage and, inevitably, death to the fish, owing to residual effects.

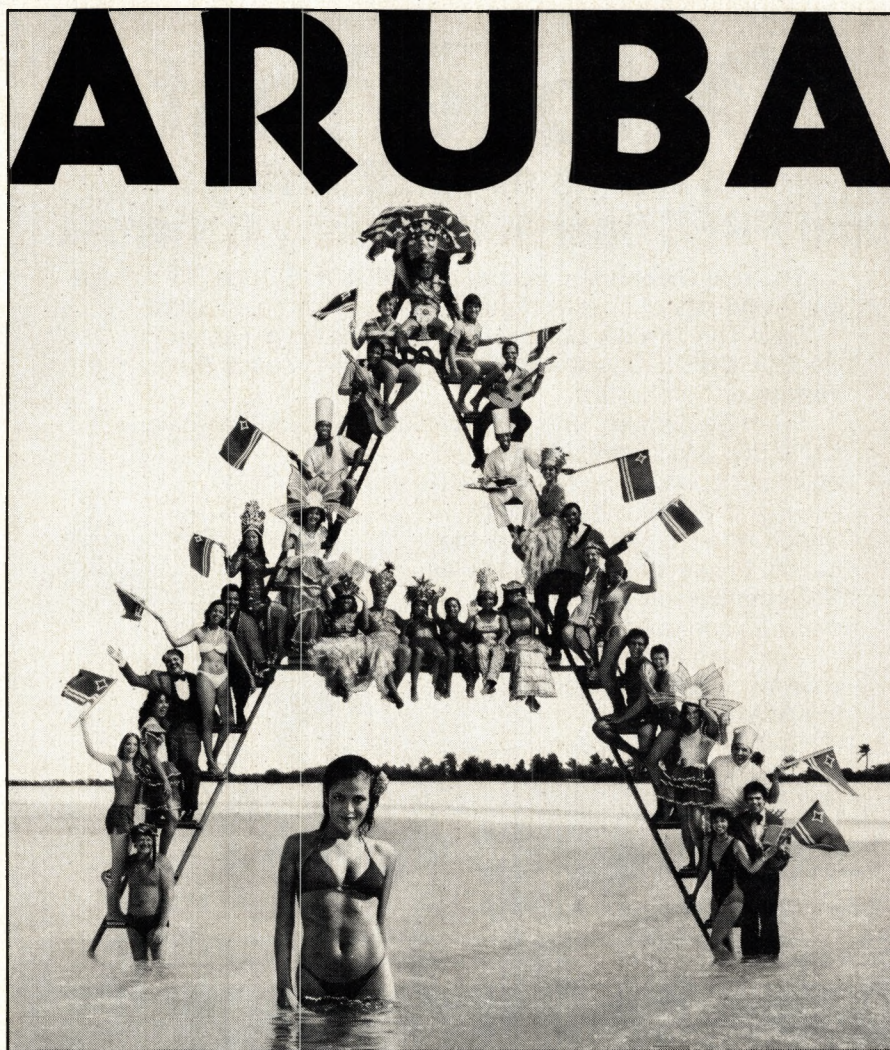
The method of transporting the fish will depend on the distance and length of traveling time. For driving times up to six hours, an ice chest containing a few inches of sea water is usually sufficient. Place it on the floor of the car, or some other place where sloshing will be minimal. For longer distances, it may be necessary to use a container of plastic foam with chemical heat packs wrapped around the outside. On a plane, it is best to either bag the fish and place them in a small cooler, or use a small watertight container with an O-ring seal. The less handling, the better, so save the collecting dive for last on a weekend trip.

When collecting natural rocks, be sure to rinse and carefully inspect them to make sure that there aren't any invertebrates clinging to them. They invariably carry parasites and can spell disaster for the aquarium. If you wish to keep invertebrates, plan on keeping a separate tank especially for them.

Placing a fish in the tank, be sure to let it acclimate in a plastic bag for at least a half hour before releasing it. Wait a couple of hours before attempting to feed it. It may take as long as a week before the fish will eat, but it usually helps speed things up to coax it with some live food, such as brine shrimp or glass worms.

For the next few weeks, keep a close watch on the nitrite content of the water, testing it at least every other day. In the event that it gets too high, remove some of the water and replace it with water that has been aged at least four hours. Undissolved salts and minerals can be deadly to fish.

The presence of algae growing in the aquarium is usually a good sign that the aquarium has completed its cycle and the biological filters are in full operation. Although it is unattractive, algae is not detrimental and provides food for many fish that prefer it over live food. Now that the cycle is completed, more fish may be added, but be sure not to overcrowd the tank. Keep only fish that are compatible



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Every four weeks, it will be necessary to change one fourth of the water, to remove excess waste and stabilize the nitrite level. Be sure to check the PH, nitrite and specific gravity at least once a week. There is a certain amount of work involved in maintaining a home aquarium, but for the true underwater enthusiast it can be a labor of love. For further information, consult your local pet shop. Good luck with your new hobby!

**HUG/DENS**

The Honduras Underwater Group (HUG) has recently implemented a Diving Emergency Notification System (DENS). This system is designed to expedite the handling of all diving emergencies in and around Honduras, as well as to improve information handling. Participants in the system include the Bay Islands Dive Resorts Association (BIDRA), the Honduran Armed Forces, various commercial dive operators and DAN.

DENS is simply a communications plan designed to provide timely information and advice to the managers of diving emergencies and, if necessary, assistance in coordinating evacuations. A second phase, already underway, includes further training for accident management personnel and the acquisition of more safety equipment. The final phase envisions an island recompression chamber, with the Honduran Armed Forces, BIDRA and commercial operators all contributing to its acquisition, installation and operation.

**HELIX/HONG KONG**

The Helix Photo/Divers will be viewing Halley's comet from the South Pacific next year. This event is just one highlight of the March dive trip to the Philippines and Hong Kong.

The trip, scheduled to begin March 23 in San Francisco, will include nine days of diving and three days of sightseeing in Hong Kong and Manila.

The floating headquarters for the dive portion of the trip is the 120 foot M/V *Lady of the Sea*. Divers will explore the reefs of Tubataha and the Sulu Sea, diving up to six times each day.

Close-up and macro equipment as well as tanks, weights and backpacks will be available. Other photo gear may be rented at specially reduced prices. The side trip to Hong Kong is optional.

For more information about the Helix Photo/Dive trip to the Philippines and Hong Kong and other upcoming events, contact Helix, 325 West Huron, Chicago, IL 60610; (800) 33-HELIX.



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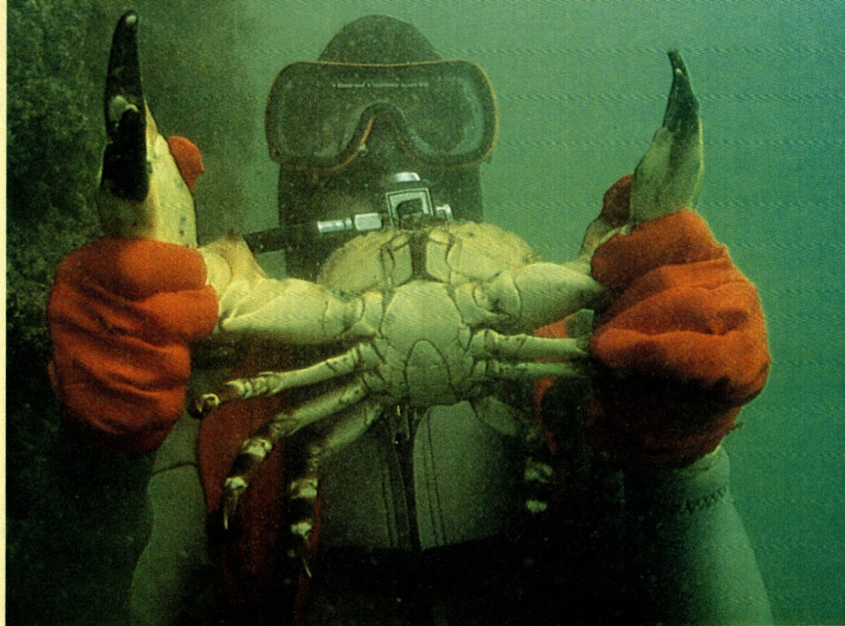
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# STONE CRAB GRABBIN'

GAME DIVING SERIES



TEXT AND PHOTOGRAPHY  
BY MARK M. LAWRENCE

**S**tone crabs taste great. Seafood lovers who haven't tried them are in for a real treat. Like the Alaskan king crab and Maryland blue crab, stone crab meat ranks high in gourmet circles. While a pound of claws costs approximately \$10 in the market, a generous portion in fine restaurants commands as much as \$19. An experienced diver, however, only has to pay for an air fill to obtain a full catch bag. In one hour, two buddy teams can grab enough claws to create a banquet.

The origin of the common name, stone crab, remains obscure. Some divers contend the name refers to the crustacean's habitat. Most individuals who have tried to crack the thick claws believe the name alludes to the rock hard shell. Stone crabs (*Menippe mercenaria*) belong to the Xanthidae family, the mud crabs. Stubby legs support the heavy body and broad arms. Except for the brown colored shell, these flattened oval crabs resemble the reef dwelling vermillion or bat crabs. However, stone crabs prefer the backwater environment. Within a range extending from Texas to the Carolinas, stone crab activities concentrate in the Floridian bays. In these murky waters, the crabs burrow under everything from mangrove roots to old bridge debris. True scavengers, the animals will eat almost anything that floats by their dens.

Crabs guard their territories aggressively. Small indentations and broken claw tips testify to their eagerness to lock claws with a neighbor. Some written accounts describe the fierce mating rituals as ending only when one male suitor successfully wrenches the arm off the other.

Although a crab-fight loser usually lives to regenerate another claw, few stone crabs survive a wrestling match with an octopus. Divers and commercial trappers have noted the vast destruction of stone crabs during increases in the local octopus population. While man eats only the claws, octopus consume only the body.

In Florida, stone crab open season runs from October 15 until May 15. During this period, any diver can collect a free meal. If you intend to sell your catch, you must have a permit. The law strictly forbids removal of whole crabs from the water but divers may take as many claws as they wish. According to the Tackle Shack's Chad Carney, "It's legal to take both claws. Most divers don't. It's not only good conservation, but if it's a favorite spot, you can return in four or five months and the same crab will have regenerated a claw. At this time you can take the one you left before." Florida Marine Patrol officers encourage single claw removal practices. Estimates of the time required to grow a new claw range from five months to two seasons. Only the claw is measured and not the adjoining arm seg-



ments. Along a straight line from the tip of the lower immovable finger to the elbow, a legal claw measures at least two and three-quarter inches.

When taking stone crabs, the law clearly prohibits the use of "grains, spears, grabs, hooks or similar devices." Hooks leave holes in the shell. Thus punctured, an egg-bearing or juvenile crustacean's chance of survival is poor. Careless use of any prod may crush a shell; skill is better than force.

A good crabbing day begins by diving around slack high tide and often ends by gathering around a boiling crab pot. Found on both patch and artificial reefs, stone crabs prefer shallow areas. Tampa Bay's numerous bridges provide many suitable habitats. The long spans have literally thousands of pilings and debris piles. In any large crack or concrete and bottom juncture, scuba divers search for retiring stone crabs. Visibility averages less than ten feet and currents often run strongly; this environment is for experienced divers only. After dividing the dive site among buddy teams, each pair works its area systematically. Diving around bridge pilings has its own special set of hazards. Remember to always dive with a flag and float and stay clear of boating channels. Florida law prohibits diving under bridges or catwalks designated as fishing areas. If you have doubts about a location, check with your dive store and the Florida Marine Patrol office.

Favorite crabbing tools include a small catch bag, a dive light and a strong metal bar. Careful inspection under narrow ledges with a light reveals hiding crabs. Many area divers prefer an intense but thin beamed light on a strong wrist lanyard. If you spot a dogfish in the crevice, don't bother to look for crabs—dogfish and stone crabs rarely cohabitate. After discovering a suitable crab, divers use a heavy metal rod or crowbar to reach in and coax the animal toward the opening. As Chad Carney said, "If you can get over that feeling that they're going to pinch your finger, you just reach in and grab them."

Despite their fearsome appearance, the crabs move surprisingly sluggishly; cold winter water also helps to slow their metabolism. The author, after becoming accustomed to their lethargic movements and perhaps slightly full of bravado, almost lost the front element of his favorite lens to an unusually energetic crab.

Generally the crabs fold their arms under their bodies to protect the soft stomach region. Reaching into the hole, the diver pins both claws against the body. At this point, the diver disappears in a cloud of silt generated by the wrestling match between the would-be crab grabber and the stubborn stone crab. Frequently an enthusiastic diver materializes from the silt cloud with a very large crab in his outstretched hands. One diver came up with

claws that were nearly as big as her own hands. Apparently, the pinch of the molar surfaces of the stone crab claws is not that bad. Many divers dread the nip of a spider crab's curved claw much more.

By marking their prods with lines every two and three-quarter inches, crab grabbers can easily measure their potential catch. After checking the animal the diver removes the larger and blunter claw. While pinning the smaller arm against the body, the crabber swings the larger arm out to its full extension. Applying steady pressure downward breaks the arm off with an audible snap. Muscle tissue inside the main body cavity must not become torn; such an injury could kill the crab. Knowledgeable divers don't take molting crabs; inside these soft shells the meat shrivels and tastes mealy. Avoiding these situations helps maintain a healthy population and guarantees that the diver can exit now and in the future with a bag full of tasty stone crab claws.

To prevent spoilage, ice down the

vorful meat also makes excellent stuffing for exotic fish dishes or a delicious salad. Any way you serve them, stone crabs are a fantastic meal.

On the first Sunday of the open season, the Tackle Shack in Pinellas Park, Florida, sponsors a special annual event. Proceeds from its stone crab festival benefit the Suncoast Seabird Sanctuary. Over the past five years the celebration has grown steadily; hundreds now attend. While chefs from a local restaurant cook the claws as fast as they receive them, the dive shop raffles off dive gear and accessories. Prizes are awarded annually based on the total weight of a participant's ten heaviest claws. The '84 champion's catch weighed about five and a half pounds; his largest claw tipped the scale at 13½ ounces!

Eating freshly caught stone crab claws is a pleasant reward for diving in murky and cold water. After watching the eager manner in which some buddy teams search out stone crabs, anyone will be

## STONE CRAB RECIPES

Most stone crab divers have their own private recipes. Although stone crab meat adds great flavor to almost any seafood dish, many divers eat the claws separately. If you're serving the claws hot from the pot, try the hot butter melt; if you're offering cold claws, add a chilled mustard sauce. These are basic recipes; season to taste.

### HOT CLAW MELT

½ lb. sweet butter  
¼ fresh lemon  
Garlic  
Fresh peppercorns  
Melt butter and lemon juice. Add garlic and peppercorns to taste.


### CHILLED MUSTARD SAUCE

8 oz. Dijon mustard  
4 oz. mayonnaise  
Worcestershire sauce  
Dry mustard  
White wine  
Mix Dijon mustard and mayonnaise until smooth. Add Worcestershire sauce, dry mustard and white wine to taste.



**It's legal to take both claws from a stone crab, however, this would leave the animal defenseless. It's a much better idea to take only one claw, allowing it to regenerate before returning to take the other.**

claws immediately. If you plan to enjoy the crab claws at a later date, cook them prior to storage. Cooking before freezing prevents the meat from clinging to the shell. Boil the claws in lightly salted water for five to ten minutes depending on the size of the batch. As they cook, the claws turn red. Most divers enjoy claws either straight from the pot with butter or chilled with a mustard sauce. However, the fla-

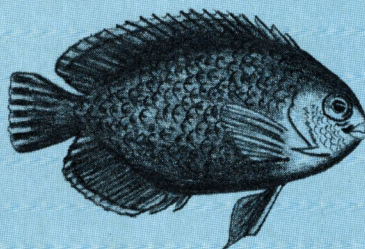
convinced that these divers derive as much thrill from the catching as they do from the eating. Rather than becoming a hindrance, the close buddy contact required by the underwater conditions helps to promote a sharing of the fun. On the surface at the end of the diving day, this spirit continues. If you like seafood and enjoy scuba diving, you'll love stone crab grabbing. 



# The Cherubfish

(*Centropyge argi*)

The cherubfish (*Centropyge argi*), also known as the pygmy angelfish, was not given its scientific name until 1951. Then it was described by the late Loren P. Woods and Robert H. Kanazawa in the journal *Fieldiana* of the Field Museum of Natural History in Chicago. They had only one specimen, which had been collected from 93 fathoms at Argus Bank by Louis L. Mowbray, the director of the Bermuda Aquarium, on Christmas day, 1908. They named it *argi* for the bank, which lies 15 miles southwest of Bermuda. A second specimen was obtained in 1952 from the stomach of a snapper caught off Yucatan. No more were obtained until 1959 when several were netted alive by the staff of the Miami Seaquarium near Bimini, Bahamas. □ We now know that this is a common species on coral reefs in Florida, the West Indies, southern Gulf of Mexico and throughout the Caribbean Sea. How could such an abundant and colorful fish remain undiscovered so long by the scientific world? Part of the answer is its predilection for moderately deep water. Although it has been observed in as little as 15 feet, it is not common in less than about 70 feet. It is not often seen in well developed reef areas, but generally on the fringes of reefs on bottoms of coral rubble. Since it is small, it can hide among the interstices of the rubble. Another reason for its early anonymity is its elusive nature. It does not stray far from shelter and darts quickly to cover with the approach of danger, hence it is difficult to catch with nets. Like other *Centropyge*, this species feeds on algae and detritus; usually there is a moderate amount of fine sand ingested with its food. Because of this, one is not apt to catch it with a small hook and the usual fish bait. □ *Centropyge* is a genus of the angelfish family



(Pomacanthidae). Once regarded as a subfamily of the butterflyfishes (Chaetodontidae), the angelfishes are now classified as a separate family for which the most distinctive character is a prominent spine on the cheek at the lower corner of the preopercle (the anterior bone of the gill cover). The species of *Centropyge* are the smallest of the angelfishes (*C. argi*, for example, attains a maximum length of only 2.7 inches), but the genus is the largest of the family, with 30 species, of which 27 reside in the vast Indo-Pacific region and three in the Atlantic. The other Atlantic species are *C. aurantonotus*, named from Barbados and Curacao in 1974 and recorded soon after from Brazil, and *C. resplendens* from Ascension Island. The author has observed one *aurantonotus* at Bonaire, among a large colony of *argi* in 80 feet. It differs from *argi* in having fewer rows of scales on the body and a broad extension of the orange-yellow color of the head onto the back. Roberto Hensen has seen some individuals of intermediate color to *argi* and *aurantonotus* and showed one to the author during a dive together at Bonaire. These may prove to be hybrids. □ Study of the reproduction of several Indo-Pacific species of *Centropyge* by Jack T. Moyer and others has revealed that they are hermaphroditic, beginning life as females. Males are a result of sex change; they maintain a harem of females within a territory that they defend vigorously against other males. If the male is removed from a territory, the ranking female changes her sex to male. *C. argi* probably has the same reproductive strategy. Some species show differences in color with sex, especially in the possession by males of blue bands that parallel the fin rays posteriorly in the dorsal and anal fins. »

*Text And Photography By John E. Randall*

Randall took the photo in 45 feet of water off Town Pier, Kralendijk, Bonaire, using a Nikon F in an Ikelite housing, Micro-Nikkor 105mm lens, twin Vivitar 292 strobes. Kodachrome 64, f/16, 18 inches from subject.









# USA Photo Contest Winners

BY PAULA M. NOVOTNY

**T**he Underwater Society of America presents the winners of its 1985 International Underwater Photography Competition, announced in May at Our World-Underwater in Chicago.

In the past four years, this competition has grown to be one of the largest in the world, with entries from 30 different countries. It is designed to provide nonprofessional underwater photographers worldwide with the opportunity to have their work published and to win thousands of dollars in prizes. Many thanks to the manufacturers and organizations that donated close to \$10,000 in prizes. These were distributed, along with award plaques, to the first, second and third place winners in each of 15 categories. A special thank you goes to our judges, Paul Tzimoulis (SKIN DIVER Magazine), Gale Livers (Ikelite), Richard Lopinto (Nikon) and Gary Yohler (Tiffany Photography

Studio) for their time and effort in judging the numerous slides, prints, movies and videos submitted.

The quality of the entries has increased each year, making every contest more difficult to judge. This can be attributed to many factors. One is the availability of underwater photography courses, offered by many professional photographers at resorts and through dive stores. Along with this is the state-of-the-art technology of today's equipment. This latter factor has provided us with the means to take good photographs. Finally, I believe the excellent quality of the entries can be attributed to the determination of divers everywhere who wish to record and share their visions of our underwater world with others.

The photos shown here are all first place winners in their respective categories. ➤

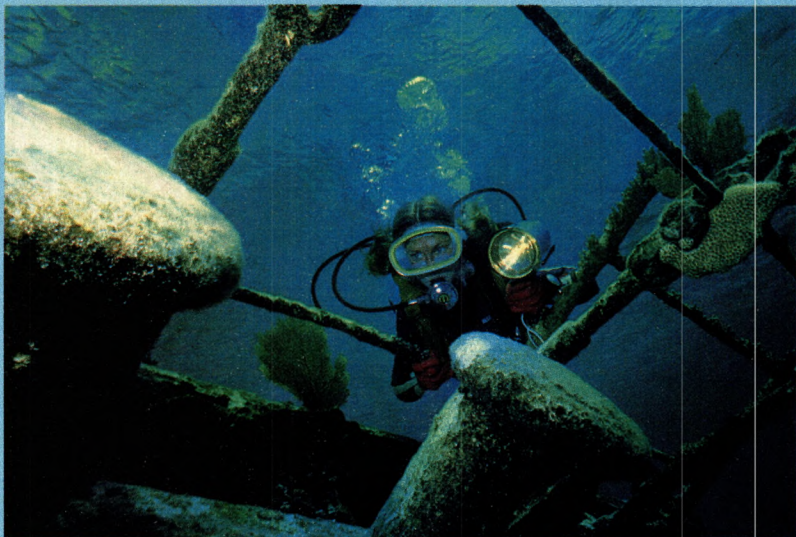


"Looking Me Over," Bev Schultz, Diver/Environment Slides

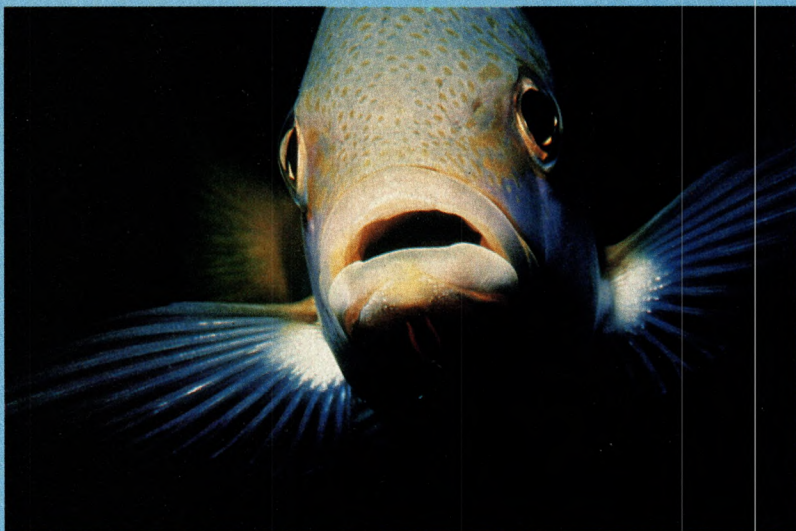
Top: "Feeding Time," David Petersen, Vertebrate Slides

Left: "Hermit," Shay Mims, Invertebrate Slides

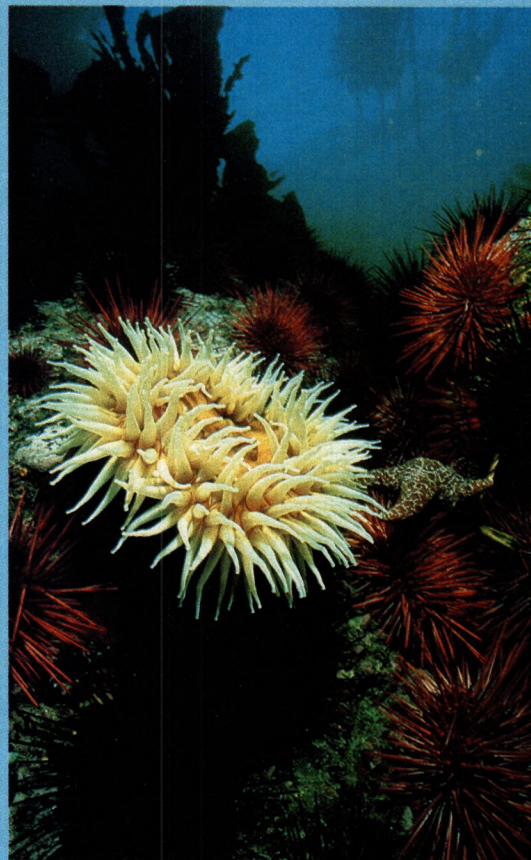




"Treasure Hunter," Shay Mims, Wreck Slides



"Yellowtail," Vic Pineda, Vertebrate Prints



"Invertebrate Delight," Stuart Westmorland, Underwater Scene Slides

"Lionfish  
Watching," J. W.  
Mowbray, Jr.,  
Diver/Environment  
Prints

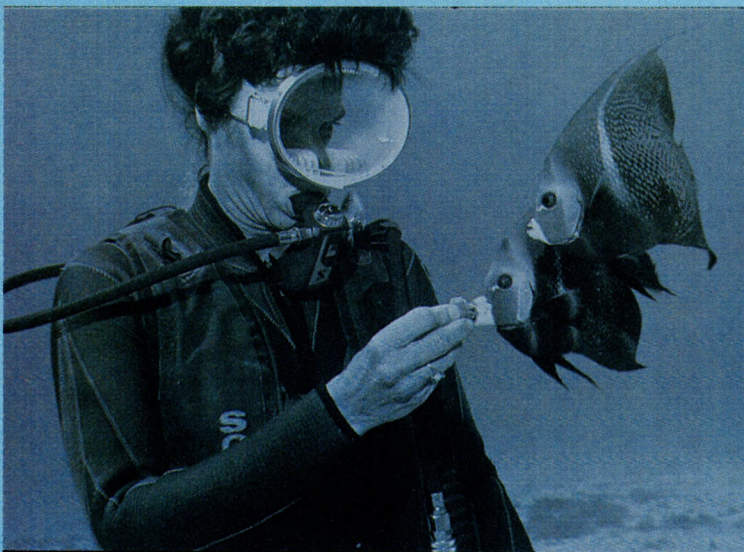


"Dancer," Steve Rosenberg, Invertebrate Prints

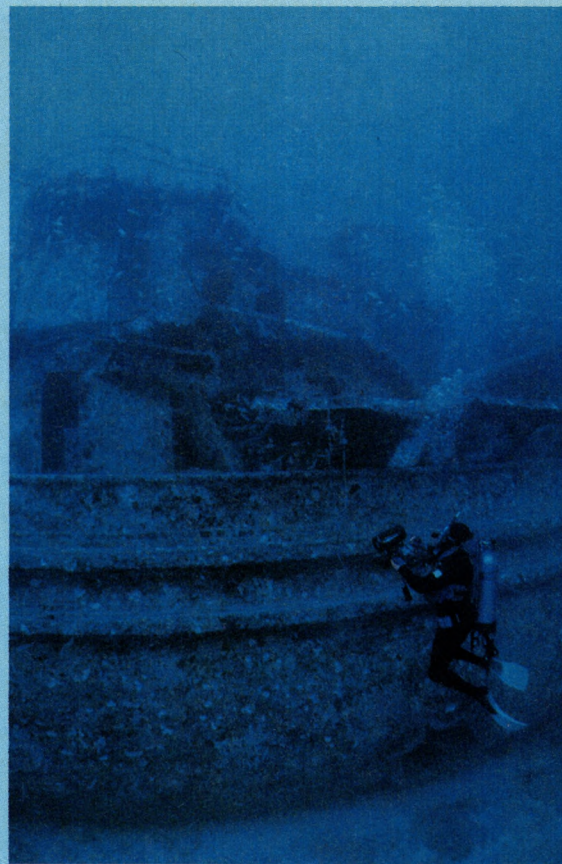




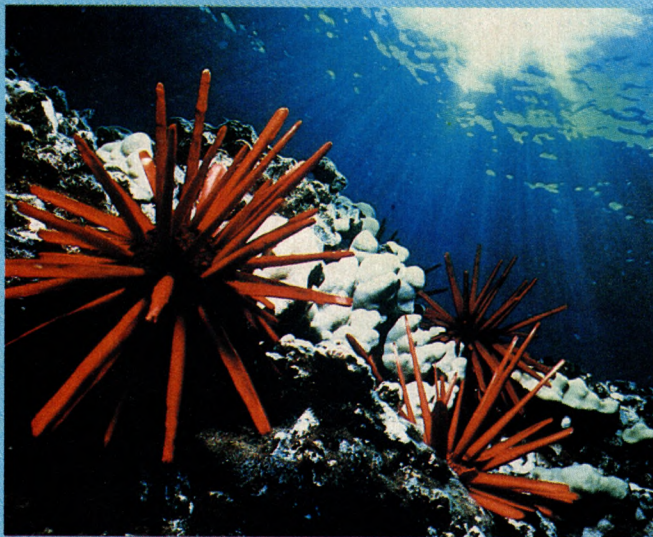
"Charging Bull Sea Lion," Elaine Geryan, Mini Format Prints



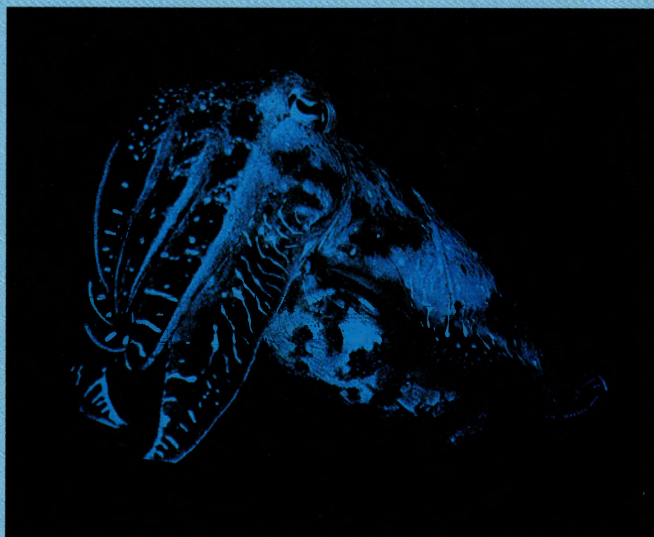
"Tweedledum and Tweedledee," Bev Schultz, B&W Prints



"Photo Opportunity," Susan Payette, Wreck Prints



"Molokini Magic," Bob MacDuffee, U/W Scene Prints



"Blues," Steve Rosenberg, Special Effect Prints

**VIDEO**

Robert Gadbois won first place in the video category with his production, "The Wrecks of Whitefish Point."

**MOVIE**

Frantisek Soukup won first place in the movie category, as well as the overall grand prize, with the film *AMA*.



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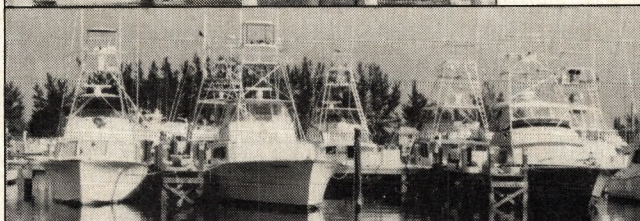
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## TEXAS TOWER #4

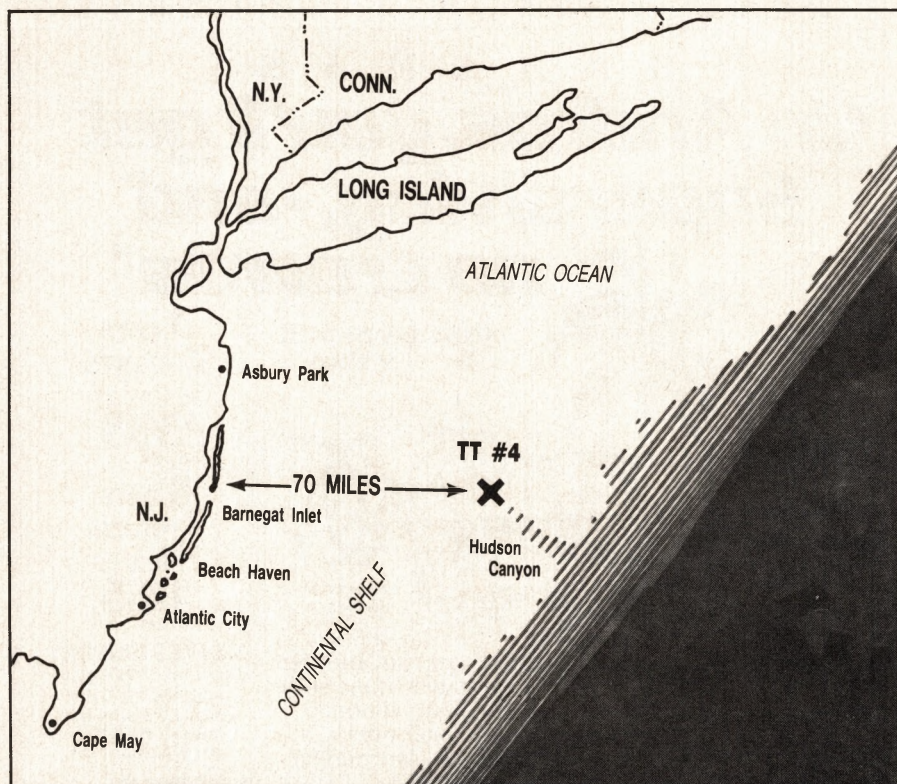
(Continued from Page 71)

wrote to his wife in Massachusetts, "Oh, brother, it's rough out here, too rough to work . . . The horror of it is awful."

An Air Force sergeant wrote to his wife in Elmira, New York, "The tower is not fit to live on. I hope it lasts long enough for me to get home and see you and the kids again." Captain Phelan told his wife that he had asked again and again to have his men evacuated—but to no avail.

The beginning of January offered no respite. Some of the men reportedly had to strap themselves into their bunks so as not to be tossed out. And, as if this weren't enough, on the flight deck there was approximately 200 tons of sand and cement the crew was to drop down into the hollow legs to give them more support. The added weight on the deck made the tower dangerously top-heavy.

On Saturday, January 14, the supply ship *T-AKL-17*, with Captain Sixto Mangual, arrived next to TT #4. The ship had been ordered to sail to the tower to remove certain classified equipment and to stand by to remove the men, if necessary. Having completed the transfer of equipment, the *T-AKL-17* cast off and stayed several hundred yards clear of the tower. Captain Mangual slowly circled it



Texas Tower #4 was positioned 70 miles off Barnegat, NJ in 187 feet of water near the edge of the continental shelf. Resembling a Gulf Coast oil rig (hence its name), it housed sophisticated radar and served as part of the U.S./Canadian Air Defense warning system. In 1961, the storm battered tower toppled into the sea with 28 crewmen.



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through the night, ready to render assistance if necessary. Sunday, January 15, found the tiny supply ship bobbing like a cork in a heavy northeast gale that had come into the area overnight. The ship had moved several miles from the tower as winds were gusting upward of 60 knots and seas had risen well over 20 feet. Gale warnings had been posted all along the East Coast.

It was late afternoon when Captain Phelan contacted the supply ship and released her from her standby duties. He suggested she seek shelter in New York Harbor, returning for him and his men the following morning. T-AKL-17 acknowledged the message but Captain Mangual stated that he would remain on station. He knew that 28 men's lives were at stake and he wanted to be there if they needed him.

Having completed his conversation with his supply ship, Captain Phelan telephoned his wife. The call was full of static but she could hear her husband's voice. "How's the tower?" she asked. "It's gyrating," he replied. He told her that earlier in the afternoon they had heard a loud noise and, upon investigation, he and his chief engineer discovered large cracks in the leg braces, which he had reported to Cape Cod. They discussed what would happen if the tower collapsed. "Would it float?" she asked. He replied, "It'll go right in, fast." But he reassured her that he was going to have his men taken off in the morning.

Captain Phelan then hurriedly went to the radio shack and sent a message to Otis Air Force Base on Cape Cod, requesting they be put on alert and stand by to send helicopters in the morning to evacuate the tower; it was too unstable to remain on board. The base notified Navy Task Force Bravo, which consisted of the carrier *Wasp* and five destroyers, to proceed immediately to the tower. Rear Adm. Allen M. Shinn, commander of the *Wasp*, informed Otis AFB that Task Force Bravo was several hours away and he would pour on the coals and reach the tower about 2200 hours (10:00 pm).

Commander Phelan then gathered his men and told them to make preparations to evacuate. A sigh of relief filtered from the men and a few were able to crack a forced smile. Each crew member returned to his quarters to pack. Captain Phelan returned to his room and called his wife again. She could hear the tenseness in his voice. He told her the tower was breaking up, but the carrier *Wasp* was sending helicopters to remove his men. He told her not to worry and reminded her he had only ten days left in his tour and no doubt the Air Force would allow him to spend the remainder of his time on shore. This calmed her, but in the background she could hear the sound of metal banging and scraping against metal. Again, he reassured her, telling her that he loved her dearly and would see her the following day. With that he hung

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## TEXAS TOWER #4

up. It would be the last time she would  
speak with her husband.

Outside the winds had increased and  
the rain was coming down in sheets. It  
was already dark but there was still 200  
tons of sand and cement on the flight  
deck. This extra weight had to be re-  
moved if the crew and the tower were to  
survive the night. Volunteers were re-  
quested to help jettison this extra weight.  
Everyone, to a man, including the civilian  
workers, raised their hands. The captain  
was pleased and instructed Master Ser-  
geant Ronald Bakke to stand by the radio  
while the rest of the crew worked on the  
lighted deck. With that, each man put on  
his warmest coat and life jacket and went  
out to do his job.

Almost instantly the cold hard sting of  
the gale-swept rain nearly cut exposed  
hands and faces. It was past 7:00 pm,  
and through the darkness Captain Phelan  
thought he saw a small twinkling light on  
the western horizon. Surely he was see-  
ing things, he thought. It was most likely  
the reflection of the lightning off the 30  
foot waves.

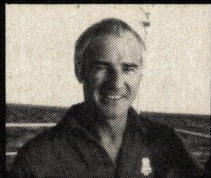
At 7:26 the men had been throwing  
sack after sack of cement and sand over-  
board for almost an hour. It seemed as if  
the pile had merely been dented. The  
men were constantly losing their footing  
and falling down on the ice-covered  
deck. Back on shore at Otis AFB prepa-  
rations were being made to ready the heli-  
copters for tomorrow morning's mercy  
mission. At 7:28 they picked up an urgent  
Mayday distress signal requesting imme-  
diate assistance.

Twelve miles away, Captain Mangual  
heard the distress signal and immediately  
turned his ship around and headed for  
the tower.

Back on the tower (7:33) the deck was  
swaying so heavily that the captain or-  
dered all his men back inside for fear of  
losing them overboard. The tower  
seemed to be screaming. Metal was  
scraping against metal and support brac-  
es started to bend and give way. It was  
too late. As Captain Phelan and his men  
scrambled back toward the relative safe-  
ty of the cargo bay, they heard a loud  
bang, like the sound of a large cannon  
going off. The deck started to fall away.  
The floodlights flickered and then went  
out. The shouts of the men were drowned  
out by the breaking of glass and the twist-  
ing of steel.

On the bridge of the supply ship, Cap-  
tain Mangual was watching his radar  
scope. A small green dot on his scope  
was his destination. That dot was the  
wobbly home for 28 men in need of as-  
sistance. But in these seas, even the big-  
gest ships would have trouble making  
headway, let alone his small vessel. He  
plowed along, full steam, with all his  
lights on. Maybe someone on board that





# CARL ROESSLER REPORTS FOR SEE & SEA TRAVEL

President, See & Sea Travel Service, Inc.  
Author, *The Underwater Wilderness*  
*Mastering Underwater Photography*  
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After five days of fantastic

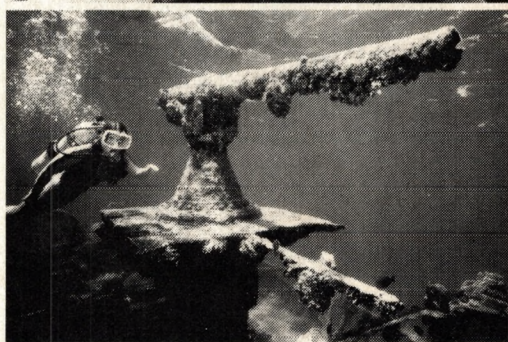
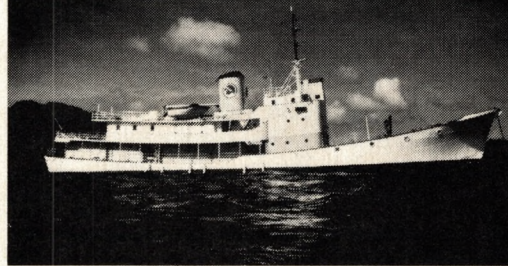
wreck diving, *Thorfinn* cruises overnight 150 miles to Oroluk Atoll: nearly as big as Truk, Oroluk boasts sheer dropoffs, 200 foot visibility, rays, turtles, schools of barracuda, sharks and other open-water thrills. On one dive, See & Sea's divers had five manta rays soaring with them for an hour. Oroluk Atoll is one of the great new finds in the entire Pacific, and Roessler's Reef a mind-blowing experience.

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## TEXAS TOWER #4

tower would be able to see his ship coming and be able to rest easily. Looking through the bridge windows, he could see nothing. The windows were glazed over with salt spray and ice, so while his helmsman tried to maintain a steady course, Captain Mangual returned his gaze to the radar scope—the only eyes that could see through the storm.

Then, the green dot on the radar screen flickered and disappeared. Captain Mangual checked the machine but everything was in working condition. He then checked the standby radar scope; it was functioning perfectly also. In unbelieving horror, the captain realized that Texas Tower #4 had collapsed into the sea. He grabbed the radio mike and called, "Tower four, Tower four," but there was only static. An immediate call was sent to the Naval Command headquarters and one of the most dramatic and heroic rescue attempts in modern naval history would take place. But there would be no survivors—just floating wreckage, mattresses, oil and much debris. The only body to be recovered was that of Master Sergeant Ronald Bakke—still near his station. Texas Tower #4 and her brave crew were gone.

### 1984

Twenty-three years later, a group of 22 North Atlantic wreck divers assembled to dive on, explore and photograph the wreck of Texas Tower #4.

The sight below us would be in my mind's eye for a long time. The water was a warm 71°F, the color a magnificent aqua blue. We could see the anchor line's flashing strobe giving off its pulsating light 110 feet below us. We could clearly see about 60 feet down, but could make out shapes and bubbles and divers' lights well below that. The highest part of the wreck of TT #4 lies about 75 feet below the surface.

My dive partner, Lee Kitson, and I started our descent. At 40 feet I felt the only noticeable thermocline, which gradually dropped the temperature to about 55°F. We hopped off the anchor line at about 105 feet. We were on the front port side of the tower below the radar section.

There were large patches of kelp growing on the upper section of the tower. We were the only divers on the back side of the wreckage. Everyone else was on the front side or down on the flight deck. We slowly descended past huge schools of bergalls and sea bass, a few large cod and empty window frames. There were pieces of trawler nets still on this side; however, we were on the leeward side of the wreck so most of the nets were hanging limp. As the current swept through the wreck, this netting would billow out of the windows and then get sucked back in-



side. It was as if a long, green, lace-covered arm was beckoning us to come into the tower through these windows. That, however, would only lead to entrapment.

We saw below us our first radar stand and stopped. We held onto the tower and checked our depth. We were at 120 feet and the only sounds were those of our bubbles. Above us the water was aqua blue. Below us we could see more wreckage, a metal mountain that dropped straight down. We dropped down a little deeper and stayed around the radar stand, photographing the wreck and the fish swimming in and out through the windows. We could see the amount of fish decreased below the radar stand, with most of them high up on the wreck.

Our brief stay on this side of the wreck was just about through, so we headed up. Even at 120 feet, we were within sight of the top of the tower.

On our second dive the sun was higher in the sky so the amount of light that penetrated the ocean's surface was more than it had been earlier in the morning. We saw the wreck while we were still well above it and left the anchor line at about 80 feet. Again, we were on the leeward side of the radar platform below the billowing brown kelp. We were level with the window openings of one of the electronics rooms so I took some pictures, then swam over and looked in. What I saw was amazing! At a distance of about 20 feet I could clearly see wreckage strewn on the floor. I could clearly see light shining down the hallway, 45-50 feet away from the hatchway on the upper side of the radar stand.

We swam up and through the kelp and into the mild current, pulling ourselves over and down the radar platform. We swam past the platform that supported the rotating radar. At the upper airlock hatchway I stopped. We could see the ladder on the wall leading down to the lower deck and I motioned to Lee that I was going down and for him to follow me. We tied off our penetration lines. I peered into the hallway looking farther down into the wreck. I could see at least three additional doorways leading into various rooms and natural light shining into the hallway from the windows, as well as light shining from the cargo entrance on the front side of the wreck. Here we were down one level on the back side of the wreck and we could see light filtering through the wreck well below us from various openings, including entrances from the other side of the tower.

We left the hatchway and swam into the first room. Not only could we see the windows up above us and divers swimming outside, but we could clearly see the anemones growing on the inside wall. We didn't even need our dive lights. We could see many pieces of wreckage and debris lying throughout the room.

We found all kinds of printed circuit boards and small electronic gadgets ly-

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


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## TEXAS TOWER #4


ing under wreckage and in the silt, so I turned my attention to photographing them. We both decided to investigate the upper right hand corner of this room, which would be the back side of the tower. There on the floor were the remains of some cabinets and a large metal lamp shade that had fallen from the ceiling. Then, in the corner of the room under some wreckage, I saw the claw and antenna of a lobster! I quickly reached down, grabbed it and pulled it out. I turned around and showed it to Lee. We flipped it upside down and saw that it was an egg bearing female so we put her gently back in her hole.

I realized, reluctantly, that our very brief visit to this room was up. We exited and swam out through the lower hatch doorway. We let the mild current carry us over to the anchor line. Soon we were back onboard our boat and were witnessing yet another marvelous sight: Three right whales had decided to adopt our boat. They would surface, blow air, then submerge, only to surface five to ten minutes later on the other side of the boat. We never knew where they would come up.

Soon we were on our way, leaving our air breathing aquatic brothers and sisters behind. I've promised myself that this trip would definitely not be my last out here. 

## FORCE FIN DESIGN AWARD


Bob Evans of Bob Evans Designs, Santa Barbara, California, has received recognition by the Design Review Board of Industrial Design Magazine and has had his Force Fin featured in *Product Design*, authored by Akiko Busch and published by PCB International of New York.

For more information contact Bob Evans Designs, 28 Anacapa Street, Santa Barbara, CA 93101. 

## THERMAL PROTECTION GUIDELINES

Diving Unlimited International (DUI) presented official thermal protection guidelines for divers at the International Association of Dive Rescue Specialists (IADRS) Dive Rescue '85 conference held recently in Ft. Collins, Colorado.

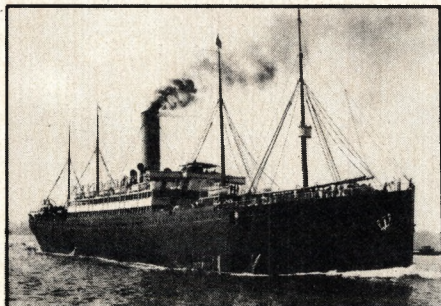
According to DUI president Richard W. Long, the operational guidelines presented to approximately 100 dive rescue team members will enable them to perform search, recovery and rescue missions with additional safety.

Copies of the thermal protection guidelines are available by writing to DUI, 1148 Delevan Drive, San Diego, CA 92102-2499. 




## REPUBLIC SALVAGE

In an effort to recover a fortune in gold from the sunken luxury liner *SS Republic*, Wolf Sub-Ocean Limited, a Canadian diving and engineering firm, conducted a survey of the wreck in cooperation with Maritime Analysts Group, Inc. last August. The wreck, in 260 feet of water off Nantucket Island, was reported to be carrying \$3 million in American gold eagle




coins (now worth up to \$1.6 billion) when it sank in 1909. Although the *Republic* took several hours to sink after being rammed by an Italian liner, allowing passengers to escape safely, Martin Bayerle of Maritime Analysts believes the gold could not have been removed as flooding shut down the engines and the crew lacked power to hoist heavy cargo.


Divers and Remotely Operated Vehicles (ROVs) were utilized in the survey, which involved entering the wreck to determine how best to remove the gold. The operation was filmed for a documentary production. Actual salvage of the gold is planned for next summer. 

## DIVING CAREER COUNSELORS

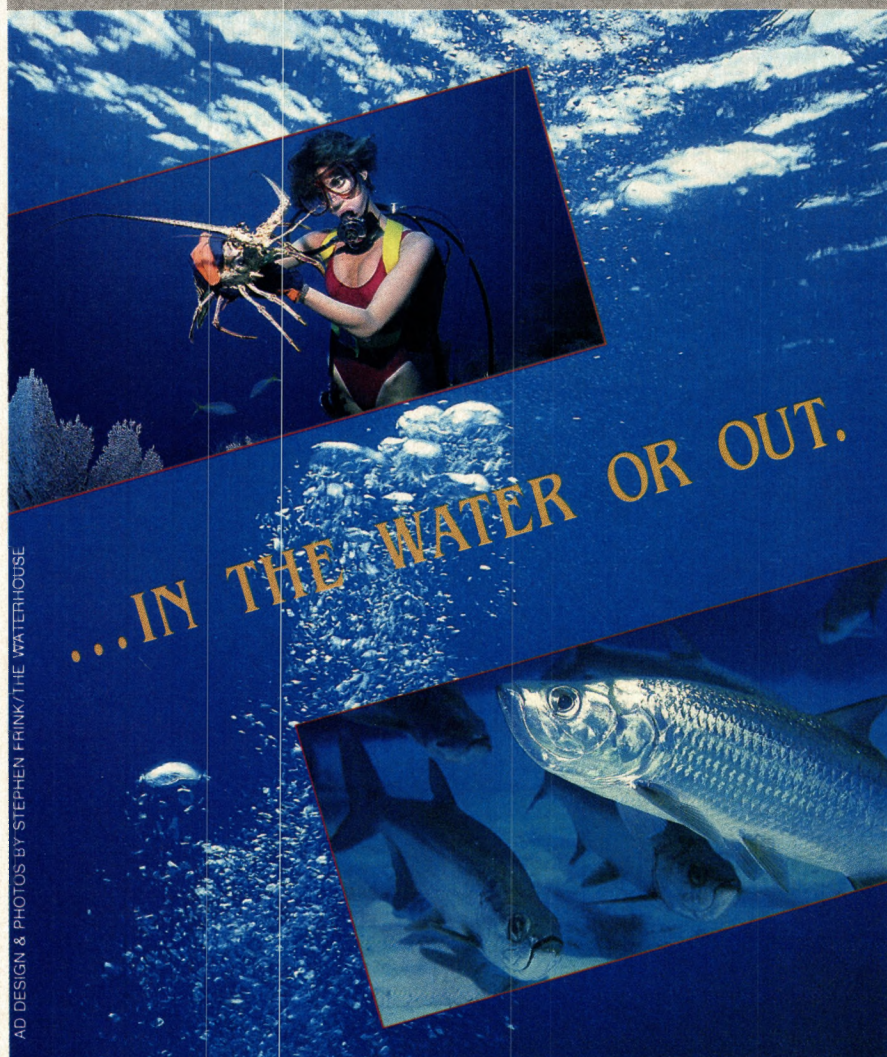
PADI International College has positions open for professional diving career counselors. To qualify, applicants must be diving retailers or instructors. Selected applicants receive training in career counseling and development from the college dean. Upon completion of this training, they are awarded a diving career counselor certificate. This, and support material available from the college, enables them to recruit and counsel applicants for the college's gold curriculum program. Counselors receive a commission on each individual who enrolls.

More information on diving career counselor training is available from PADI International College, 1243 East Warner Avenue, Santa Ana, CA 92705. 

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# Lobster Diving

## How To Score Big On Opening Day

BY HARRY AVERILL

**T**his year lobster season in California opens at 12:01 am, Wednesday, October 2. This is the day you are most likely to bag your daily limit of seven. You will have an easier time doing it and you may even take home bigger lobsters in the process! Here's why:

During the preceding months, lobsters are unmolested by divers. Their population increases. Most lobsters molt just prior to the season's start. For many, this additional growth makes them legal size for the first time. And, without the constant assault of divers, lobsters grow less cautious about the approach of bubbles and lights.

To take full advantage of opening day, you must do four things. First, prepare ahead of time. Second, be in the water, ready to go, at 12:01 am, October 2. Third, go where you are most likely to find lobsters. Fourth, you and your buddy must put as much distance as possible between yourselves and other divers.

You will spend more time preparing for opening day than you will actually bagging your limit. Yet, preparation is what makes it all possible.

Begin with your equipment. Service major items such as tanks, regulators and BCs. Upgrade comfort-related items such as exposure suits. These must keep you warm in the night air and cooler winter waters.

How about your game bag? The best lobster bags have little or no mesh to entangle lobster spines. You may also want to consider one of the newer designs that allows one-handed operation.

Carry a lobster gauge. Make certain it is the current legal size, three and one-quarter inches. Most divers attach these to their game bags.

Lights are important. Your primary light should have a wide, powerful beam. You should also carry a three or four cell backup light, plus a chemical glow light attached to your tank. Be sure to obtain fresh batteries ahead of time.

You and your buddy must also prepare yourselves. Advanced and refresher courses can increase your general diving knowledge and skills. Specialty training in underwater hunting and collecting is also available.

Make practice dives together prior to opening day. These will make you more comfortable diving at night. They can make you more familiar with new or additional equipment. They will also allow you to practice the teamwork necessary for effective lobstering. Such teamwork calls for four hands: one each for the light, gauge, lobster and bag. Many buddies switch off being catcher or bag person each time they catch a lobster.

An advantage of such preparatory dives is that they allow you to spot the best areas for lobster ahead of time. These will be different from the areas in which you normally dive. The water will be shallow—sometimes as little as five feet deep. There will be lots of holes and crevices. Stone breakwaters are a favorite lobster habitat.

As you scout potential lobster grounds, get a feel for what a legal-sized lobster looks like. Catching shorts may damage them. It also makes them more leery of divers when they grow to legal size.

If planning a charter boat trip for opening day, make your reservations early because these fill up fast.

You and your buddy should remember

to renew your saltwater fishing licenses. It will help to review current Fish and Game regulations, too.

Being in the water at 12:01 am, October 2, is critical. Otherwise, you cannot count on being the first to get to the best spots. If diving from a private boat or shore, this involves timing your entry to occur just prior to midnight, October 1. If diving from a charter boat, suit up while the vessel is underway. Then you will be ready to enter the water the minute the captain opens the gate.

Once you are in the water, it is time to put the final phase of your strategy to work. That is for you and your buddy to put yourselves where the lobsters are and the other divers are not.


Mike Curtis is a biologist for Marine Biological Consultants/Applied Environmental Services. He is a consistent winner of opening-day lobster-catching contests. Here is what he advises:

"First, cover ground. If the lobsters aren't in one spot, carefully examining holes and crevices will not cause them to magically appear. Go someplace else. This, of course, requires good navigational skills. There is no use bagging your limit if you have to abandon it to make a long swim back to the boat.

"Avoid other dive teams. There is no use working a spot someone else has been over. When you see another team's lights, veer off 90 degrees.

"When you do see a lobster, grab it. Don't waste time analyzing the situation. The lobster will figure out what is going on within seconds of seeing your light. As soon as it does, it will quickly go some place out of reach. You are better off reacting the minute you see antennae."

Once you catch your lobster, gauge it *before* it goes in the bag. It is tragic to believe you have your limit, only to find out later that most are undersize. It is also illegal to bring shorts aboard a boat and inspections by Fish and Game wardens are something you can almost count on happening opening day.

You will find that the techniques described here also work throughout the season. Nothing, however, can match the thrill that comes from bagging your limit opening day. 

### CALIFORNIA LOBSTER REGULATIONS

1. Anyone 16 years and older must have a current fishing license.
2. Lobsters may be taken by hand. No diver may possess a hooked device.
3. Lobster season is from the first Wednesday in October through the first Wednesday after the 15th of March.
4. The daily limit for lobster is seven.
5. The minimum size for lobster is three and one-fourth inches measured in a straight line on the mid-line of the back from the rear edge of the eye socket to the rear edge of the body shell.

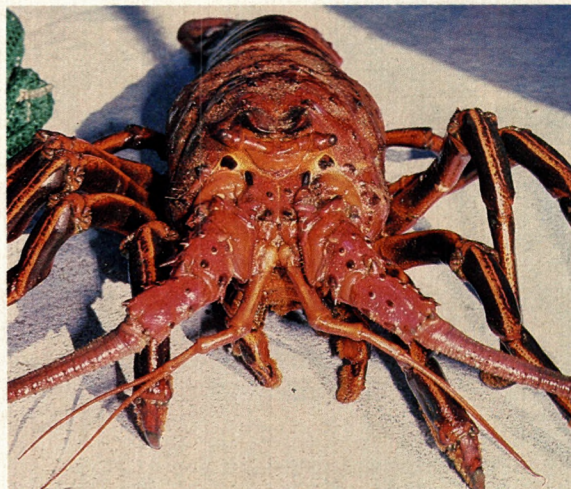
Consult the 1985 California Sportfishing Regulations for more information. These are available at many dive stores, sport fishing landings or from the Department of Fish and Game, 1416 Ninth Street, Sacramento, CA 95814.





photos/Bonnie J. Cardone

Clockwise, from left: Santa Monica Blue Fin Andre Pillons and his 9½ pound lobster head for the surface at Cortes Banks; face-to-face with an 11½ pounder on the deck of the *Scuba Queen*; instructor Bill Sick demonstrates proper bug bagging techniques at San Clemente Island.





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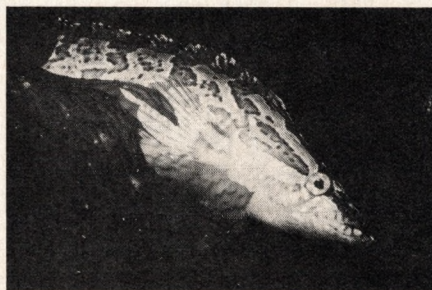
# Mexico's Coronado Islands

## San Diego's Backyard Dive Spot

TEXT AND PHOTOGRAPHY  
BY DOC WHITE

Fourteen miles south of San Diego, in Mexican waters, are the Coronado Islands. Of the four islands, North and South Coronado are the largest. The smaller Middle Rock and Middle Island complete the group. Discovered by Cabrillo in 1542, the islands' legend holds that pirates lay in wait for Spanish ships making the trip from Manila.

In the past, Los Coronados supported a large population of sea otters. During the first half of the 19th century, their coats became fashionable and they were hunted until there were none left on the islands. In the 1930s, Mexicans built the



Coronados Yacht Club on the cliff face of Smuggler's Cove, South Coronado. Failing as a casino, the club now temporarily houses fishermen working the islands. The only other inhabitant is the lighthouse keeper, who tends the two lights at the north and south end of Coronado del Sur.

For many years, heavy diving and overfishing severely depleted the abalone, lobster and fish populations of Los Coronados. As a result, the Mexican government now prohibits the taking of shellfish by all but Mexican nationals. Fishing is legal, but when fishing Mexican waters every person on board must have a valid Mexican fishing license.

Divers can now find colonies of California sea lions, harbor seals and elephant seals in these islands. Gray whales pass Los Coronados on their yearly migration to the lagoons of Baja.

Large colonies of pelicans, cormorants

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and seagulls, which are found on all four islands, breed and nest on North Coronado, where no snakes are found.

#### **NORTH CORONADO**

The most dived cove on this island is the Lobster Shack, though the use of the word "shack" makes it sound more palatial than it is. On the lee side, it provides good anchorage with a 60 foot depth and a sandy bottom, which changes to rock

local spearfishing, especially when the yellowtail are running. Accustomed to people, the sea lions will take speared fish right off the spear or fishing line.

#### **THE MIDDLE ISLANDS**

Middle Rock has a rocky bottom at 40 feet. There is a cave just inside the northeastern end which, in calm seas, can be navigated by divers. The entrance is quite large, opening into a wide hole through

which divers can climb out of the rock to a point overlooking the cave entrance. Occasionally sea lions can be found in the inner chamber. A hundred meters south is Middle Island. The area between is deep enough for the passage of gray whales on their southerly migration. Middle Island has good diving at 30-40 feet with a rocky bottom. This area has an abundance of moray eels, octopus, shrimp and nudibranchs for the underwater photographer.




The abundant marine life of Los Coronados includes kelpfish, morays, sea lions.

and rises vertically close to shore. The cove itself levels at 20 feet and shallows more gradually to a grassy bottom. There is a resident group of sea lions and harbor seals to dive with.

The northern point of the island is known locally, but not affectionately, as Pucky Point. This area provides the best



#### **SOUTH CORONADO**

The northern and southern ends of this island have the best diving locations. The northern end is similar to the Middle Islands with its own group of sea lions. Like the Middle Islands, it is exposed and should be dived accordingly. The southern end is the only spot that can be dived in rough weather, though it sometimes is subject to swells wrapping around its south end. The bottom, at 35 feet, is sand and rock. There is a small kelp bed and, close to shore, the bottom rises sharply with outlying rocks. Here are found additional colonies of sea lions and seals. Three-quarters of a mile off the southern end (about a five minute boat ride) is a large kelp bed called, not so originally, the Five Minute Kelp, which offers 60-80 foot depths. This area is not as frequently dived and is more pristine. 



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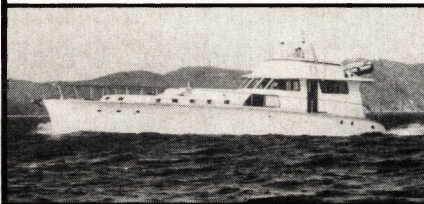
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Divers will be happy to know that Cayman's first toll free number is (800) Bob Soto. This unique diving number is available to provide information and handle direct reservations for Ron Kipp's Cayman Diving Lodge.

The first toll free number in the Cayman Islands became operational in mid August, with the telephone occupying a prominent place on the desk of Ron Kipp, president of both Bob Soto's and the Cayman Diving Lodge. The phone will be manned by Kipp and other divers knowledgeable about Cayman's East End diving. The Cayman Diving Lodge offers complete diving packages for the serious diver. For more information contact Ron Kipp at (naturally) (800) Bob Soto.

## SEE & SEA/GREAT WHITE

In February of 1986, See & Sea Travel of San Francisco will observe the tenth anniversary of its first great white shark expedition. To celebrate, Carl Roessler will escort an anniversary group to Australia for eight days of shark filming.

For further information contact See & Sea Travel, Inc., 680 Beach Street, Suite 340, San Francisco, CA 94109; (415) 771-0077.

## CAVERN DIVING WORKSHOPS

The National Association for Cave Diving (NACD) will present its bi-annual cave and cavern diving orientation course Saturday and Sunday, October 26-27. The workshop, entitled A Need for Better Understanding, will take place on Saturday at Manatee Springs State Park, near Chiefland, Florida. On Sunday it will move to Ginnie Springs.

The purpose of the workshop is to expose participants to the special requirements of diving caves and caverns and is open to all certified scuba instructors and advanced divers. Those completing the cavern training portion of the course will receive the NACD cavern diver certification card.

Registration by mail is \$60 and thereafter \$75. For more information contact: NACD General Manager, P.O. Box 14492, Gainesville, FL 32604 or call workshop coordinator Steve Gerrard at (904) 656-1223 (after 5:00 pm).

## PADI RECORD YEAR

For the third year in a row, PADI diver certifications have grown at a record rate. Figures released for the first half of 1985 show entry level certifications up 34 percent over 1984. Advanced and rescue diver certifications were up 52 percent. In total, 105,000 divers received PADI certifications during the first six months of 1985.

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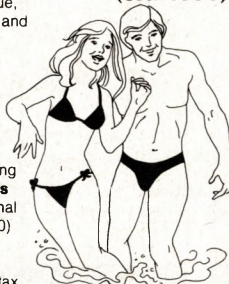
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The kit contains magnifying glass, cement and adequate instructions for the layman.

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## CEDAM EXPEDITIONS

CEDAM International, the non-profit organization dedicated to Conservation, Education, Diving, Archaeology and Museums, is seeking participants for its 1985-86 marine biology and nautical archaeology expeditions. Led by experts from universities and foundations, these



offer scuba divers a unique opportunity to learn about the underwater environment.

According to Rick Sammon, president of CEDAM International, "We don't just scuba dive all day and look at the pretty fishes and corals. All our dives have a purpose. This hands-on type of expedition is rewarding, educational and fun."

CEDAM International is also actively involved in several nautical archaeology projects. "Perhaps our most exciting project at the moment is exploring the 'Lost City of Nueva Cadiz,' in Venezuela," said Sammon.

Other CEDAM International expeditions planned for 1985-86 include: a marine study program in the Curacao Underwater Park; a fish collection expedition in Honduras; and a reef survey in Los Roques, Venezuela.

Membership in CEDAM International is open to all serious divers. Yearly dues are \$15. Members receive the quarterly newsletter Reef Report, which features articles on the marine environment. For a free copy of it and information on CEDAM International expeditions, write: Rick Sammon, CEDAM International, Fox Road, Croton-on-Hudson, NY 10520.

## DACOR/JUSTUS STAINLESS STEEL TANKS

Dacor Corporation of Northfield, Illinois and Justus Enterprises of Chanute, Kansas are introducing stainless steel cylinders to the diving industry. Two sizes will be available: an 80 cubic foot, 3,000 psi tank—four inches shorter than an aluminum 80—and a 68 cubic foot, 3,000 psi tank—two and one half inches shorter than an aluminum 63. Both cylinders will have a diameter of 7.25 inches, the same as an aluminum 80.

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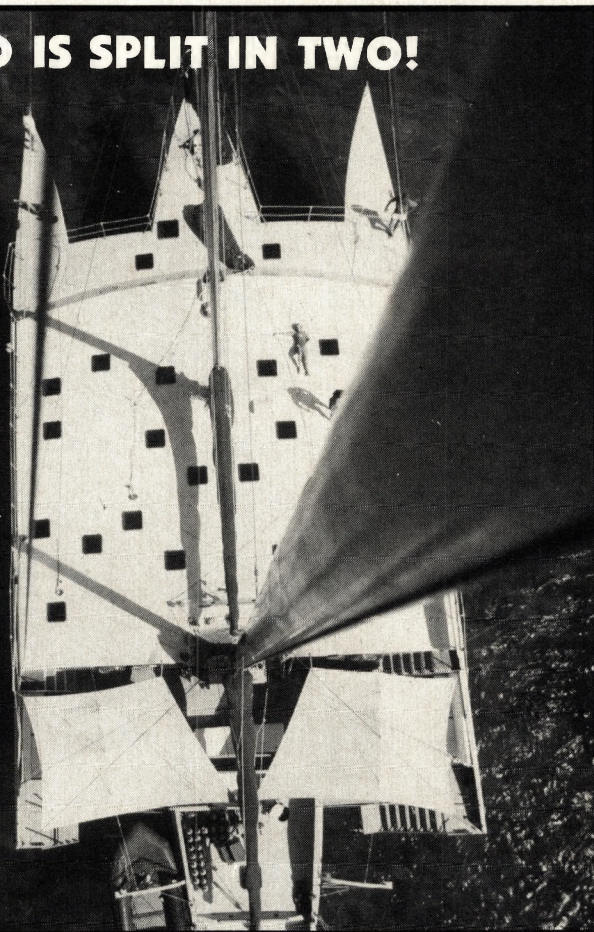
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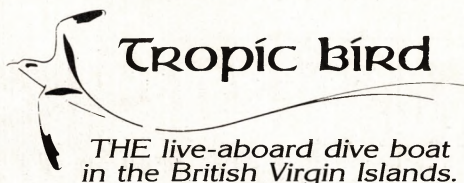
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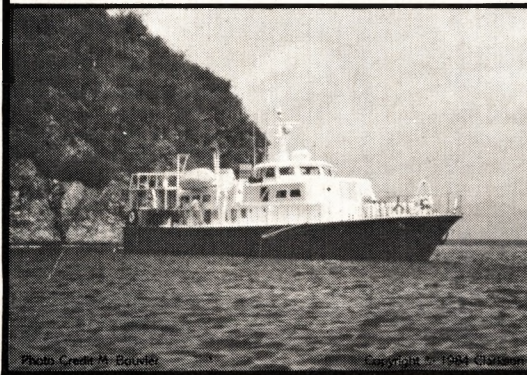


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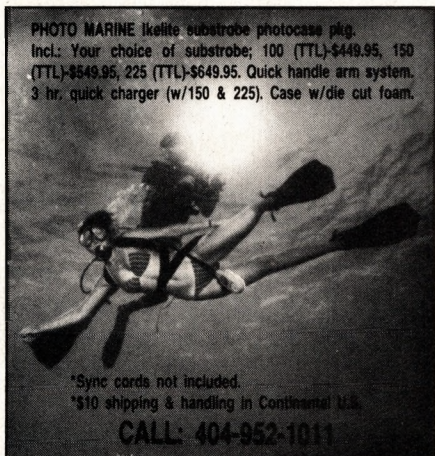
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MAUI COUNTY

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## LA MER/CAYMAN

La Mer Diving Seafari of New York is offering a dive program to Little Cayman Island aboard the 65 foot *Little Cayman Diver*. Departing weekly from Cayman Brac, the vessel cruises at 16 knots, ensuring six days of unlimited diving in an eight day/seven night program.

The *Little Cayman Diver* is owned and operated by Winston McDermot of Brac Aquatics. Fully certified by the U.S. Coast Guard, she has eight fully air-conditioned, private double cabins; four adjoining heads/showers; a large saloon; spacious deck area; and is specially equipped for diving with dual compressors, air bank, 32 aluminum tanks, diving platform and two Zodiacs. La Mer will begin offering the programs November 23. The one week trip includes all meals, transfers, tips and taxes.

Throughout the year, La Mer will offer photography and marine biology expeditions. These will be led by Dr. Eugenie Clark, David Doubilet, Amos Nachoum, Dee Scarr, Steve Lucas and others.

For reservations and additional information, call La Mer (800) DIVE-NOW (in New York and Alaska, (212) 599-0886), or write: La Mer Diving Seafari, Inc., 823 United Nations Plaza, Suite 810, New York, NY 10017.

## AMIDON TO NAUI

Walt Amidon has been appointed NAUI West Coast field service representative. His responsibilities will be to service and provide in-house consulting for NAUI Pro Facilities in the nine western states (excluding Hawaii).

Amidon has strong management experience, gained in successful retail dive store operations. He has owned his own dive store, taught diving and put together local charters and trips.


## MOONSTONE SAFE RECOVERED

The safe of a sunken World War II patrol craft was recently recovered from a wreck site 27 miles off the coast of Delaware. A team of sport divers, led by Scott Jenkins, Ken Smith and Captain Larry Keen, was successful in its salvage attempt of the 427 pound safe, recovered from the sunken U.S.S. *Moonstone*.

In 1981, Jenkins researched all available information on the luxury yacht that was converted to a German submarine chaser. His quest led him to becoming friends with the ship's captain, who told Jenkins of the approximate location and contents of the safe. Owing to extremely low visibility and tremendous hardships on the divers, the safe was not discovered until July 1983. At that time, Jenkins found it completely buried in the silt and the team began removing layers of mud



and all types of debris. At one point, Keen removed a water-cooled 50 caliber machine gun from the work area. In addition to the debris, the divers were hampered by the depth of 130 feet and required penetration far into the wreck. Smith and Keen made the final dive that broke the safe away from the mounting, lifted it outside the wreck and sent it to the surface with lift bags.


The contents of the safe are still not completely assessed, but it has been determined that all the captain's personal jewelry was intact with several items bearing his name or engraved initials. In addition to the normal military memorabilia, there was also a gold watch, still in the case, and various pieces of men's and women's jewelry. In one of the drawers, there appeared to be numerous documents, yet to be restored. 

### DIVE RESCUE COURSE

Sixteen firemen, police officers and sheriff's deputies recently completed a five day course in advanced dive rescue techniques at Santa Barbara City College. The course centered on the use of surface supplied masks and helmets with



communications. Rescue/recovery exercises included techniques for weapons recovery, body recovery and contaminated water operations.

The course was funded by POST (Police Officer Standards and Training) and was free for law enforcement personnel in California. For information on future courses, contact Mike Von Alvensleben at Santa Barbara City College, Marine Technology, 721 Cliff Drive, Santa Barbara, California 93109; (805) 965-0581, extension 426 and 427. 

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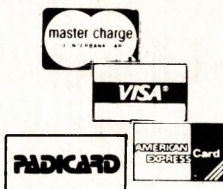
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Nylon II Five-Finger Gloves . . . 14.95  
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## BUOYANCY COMPENSATORS

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## ACCESSORIES

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Kendall, FL 33156  
(305) 667-4622

**★ New Store ★  
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Miami, FL 33015  
(305) 825-7722

## WEST COAST

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San Diego, CA 92110  
(619) 298-0531

**Long Beach, Cal.**  
4148 Viking Way  
Long Beach, CA 90808  
(213) 421-8939  
(714) 827-5110

**Los Angeles, Cal.**  
11830 W. Pico Blvd.  
W. Los Angeles, CA 90064  
(213) 477-5021

**San Francisco, Cal.**  
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San Francisco, CA 94107  
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**Kent, Wash.**  
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Underwater Life Support Systems are potentially dangerous to a non-trained user. These include scuba tanks, regulators and buoyancy compensators. This does not constitute an offer to sell these items via mail order.

## RESCUE SEMINAR

October 7-11 the Terrebonne Parish Sheriff's Office, in conjunction with Houma Watersports, Inc. and Dive-Rescue International Inc. of Fort Collins, Colorado, will be hosting its second annual Dive-Rescue Seminar.

The course length is five days. Because of the comprehensive nature of this course, students must have attended Dive-Rescue's Dive-Rescue I or underwater investigator course. Each student will have to furnish full scuba gear as well as leather gloves, lace-up shoes or boots and a helmet. If possible, students should also bring a rappel harness. Special arrangements have been made at a local inn for those attending the seminar.

For further information, contact: Dive-Rescue Int./Inc., 2619 Canton Court, Ft. Collins, CO 80525; (303) 482-0887, or Donald Adams; Houma Watersports, Inc., 3219 West Main St., Houma, LA 70360; (504) 879-2900, or Det. Mike Solet, T.P.S.O., P.O. Box 1670, Houma, LA 70361; (504) 876-2500. ✕

## UVTC ROV CLASS

The Underwater Vehicle Training Center of Houston, Texas, has completed its first ROV pilot/technician course. Fourteen of the 16 students were hired worldwide by major ROV/diving contractors prior to graduation. While there remains no substitute for hands-on field experience, ROV contractors agree there is a need for pre-qualified personnel ready to benefit from ROV operations offshore based on their UVTC training experience.

Seahawk Marine, Inc. of Houston sponsored the first program by providing a variety of specialized connectors for student lab sessions. Other firms, including C.A. Richards and Associates, presented lecture programs on the latest ROV support and navigation equipment.

For further information on UVTC's pilot/technician training program contact: Underwater Vehicle Training Center, a Division of the Professional Diving School of New York, 10046 Chickasaw, Houston, Texas, (212) 885-0600, or Telex 4620684. ✕

## DEEP DIVING WORKSHOPS

NAUI College will conduct two intensive workshops on deep diving. The first, held at the College's Southern California campus, will occur October 18-20. The second will be held in Dallas, Texas October 27-29. Open to divers of all levels, the workshops cover topics such as dive tables, dive planning, equipment, decompression diving, emergency procedures and chamber operations.

For more information contact NAUI College, 27402 Camino Capistrano, Suite 103, Laguna Niguel, CA 92677; (714) 582-0186. ✕



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## BRAC REEF

(Continued from Page 74)

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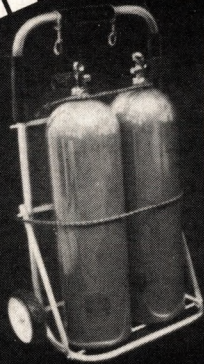


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## EDITORIAL

(Continued from Page 4)

advance, the two divers flew to their island paradise for a vacation they could finally afford. The next morning, they showed up at the dive shop for their special hotel/dive package tour. The guide behind the counter looked at them blankly and stated that he had never heard of any special-priced hotel package. The divers would have to pay the regular price and since the boss was away on business, there was no need for further discussion. After a fruitless argument, the disappointed divers returned to the hotel and complained to the desk clerk, who also claimed to know nothing about any special package. The divers raced back to their room, grabbed the magazine ad and started hunting for the hotel manager. By mid-morning, they had located him. He was all apologies as he quietly admitted the ad was part of a new advertising campaign that had never been explained to either the desk clerk or the dive guide working at the shop. The divers missed their first morning dive, but finally got the vacation they paid for.

A group of 20 divers booked a special charter flight travel package to an exclusive hotel resort in the islands that was reputed to have really fantastic wall diving. The flight was fine, the hotel was elegant and the food was indeed sumptuous. The beginning of their vacation was everything they had hoped for, but the next morning turned into a nightmare. Upon arrival at the dive shop the group was advised that the owner was off the island getting his big boat repaired. In fact, all four boats at this resort were broken and dive trips had been cancelled for at least a couple of weeks. Furthermore, no alternate arrangements had been made with any of the other boats at the marina and the underwater guides had taken a few days off. The group complained to the hotel manager but he simply shrugged his shoulders. Apparently, the dive shop operation was a private concession and therefore beyond the control or responsibility of the hotel manager. The dive group spent five days on a beautiful tropical island less than one-half mile from a fabulous drop-off and 200 foot visibility. They returned home without making a single dive.

How can you protect yourself from such rip-offs? While there is no absolute bulletproof formula for avoiding rip-offs, there are certain things you can do to protect yourself. First of all, deal only with established, reputable dive resort businesses. Generally speaking, you will find these operators advertising in the pages of SKIN DIVER. If they can afford to advertise, they are probably serious about soliciting your business and providing satisfactory services. Advertising is an



expensive investment and no conscientious businessman would jeopardize this investment by shortchanging customers.

It is also important for you to know who you are dealing with. There is no better reference than a testimonial from a satisfied customer. Ask other divers about the resort's reputation. Also, request references from the dive operator. Before sending your money, obtain assurances that you will get the diving for which you contracted or have your money refunded.

Perhaps the most important way to protect yourself is by purchasing your dive vacation the right way. One of the best sources is a specialty dive travel agent who has done the necessary research and knows which operators are credible and which ones are not. There are at least one-half dozen of these agents who advertise in SKIN DIVER on a consistent basis. They will book you with only the most reliable dive operators and exert enough economic clout to ensure you receive the very best treatment.

What should you do if you feel you are getting ripped-off? Obviously you are going to complain, but first develop the right attitude for handling such a situation. Promise yourself you will remain calm and discuss the problem without getting emotional. Seek someone in authority. Don't expect hotel desk clerks to solve your problems—they rarely have the authority to do so. Instead, request a meeting with the hotel manager, the hotel owner, the dive shop owner or someone on this level of management. Such people are usually more understanding and eager to resolve the problem and satisfy their customers. If you cannot resolve your problem on the spot, file a complaint letter when you return home.

Your first complaint letter should be to the owner of the dive operation or the hotel property. He/she represents the ultimate authority for making decisions. Explain your problem clearly and concisely and suggest a method for fair compensation. If you do not obtain satisfaction or a response within 30 days, file a second complaint letter, with stronger wording, for immediate action. If your problem is not resolved within another 30 days, you may want to take the matter further by filing complaints with the island's hotel association, government tourist board, or other public agencies of this nature. Incidentally, SKIN DIVER would also be interested in hearing your complaint.

To those of you who have suffered such dive/travel rip-offs in the past, we can only say that the industry is doing its best to eliminate such problems. It is still in the infancy of its development and much of its present growth is on a trial and error basis. Every diver who goes on a tropical vacation is certainly entitled to fair treatment. The majority return home happy and well satisfied with their dive experiences. We want to make sure that everyone does.

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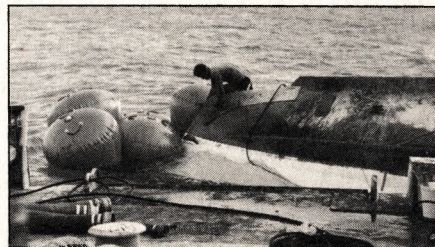
## TECHNIFACTS

(Continued from Page 18)

compressors for helmet gear plus one high pressure unit for filling scuba tanks were landed below decks and lashed down for safety. Several sheets of three-eighths inch marine plywood, fiberglass material and resin were also placed aboard for the job. Pneumatic and hydraulic tools for sawing, drilling, grinding, sanding and fitting the plywood and fiberglass patches were also stowed below. Gasoline and diesel driven pumps completed the list of heavy equipment deemed necessary for a successful salvage effort. Finally, stores and water were loaded.



photos/Chris Bokelman



Top: Trimming the bow of the Carolyn K. Above: Adding plywood patches to the hole.

By 0700 on February 9 the *Holo Kai* was loaded. Pat Wolter was back from French Frigate Shoals. A lengthy strategy meeting was held. Detailed plans for an unusual salvage technique were developed and each crew member briefed on the parts he would play in the undersea work. Lou Burns, skipper of the *Holo Kai*, was designated salvage master. Chris Bokelman shipped out as deckhand and diver. "Andy" Anderson and "Mac" McPherson were signed on as divers. Andy was also navigator. Jimmy Grimshaw sailed as cook, an important member of any seagoing crew.

The *Holo Kai* is not a large vessel at about 65 feet long, but she is beamy and rugged and is designed for marine research. The vessel is also an excellent diving platform and base for a salvage job. She is completely equipped for "black box" navigation with Loran and Omega systems, radar, depth recorders, sonar and radio direction finders as well as excellent radio communication systems. She was underway for French Frigate Shoals at 1130 on the 9th and cleared Honolulu Harbor an hour later.

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The crew of five was divided into four, three-hour watches with cook Jimmy Grimshaw exempt. In American Divers' crews all hands can perform all jobs and operate and interpret readings of all equipment, including navigational gear. By 0100 on the 10th the vessel was well across Kauai Channel and nearing Niihau Island. At 0200 a dark target appeared on the radar scope. Dead ahead, completely across the northern horizon, were stuttering streaks of blazing light. The *Holo Kai* was headed directly into a windy, crashing thunderstorm. With wind blowing at 30 knots or so and visibility at near zero owing to heavy rain, the crew relied on radar and electronic navigational aids for a safe passage past little Niihau Island. By 0600 it was well astern.

By 1600 on the 11th the *Holo Kai* was off the windward side of French Frigate Shoals and surrounded by hundreds of porpoises. As darkness set in the lights of the fishing vessel *Faresa* could be seen. The *Holo Kai* was carefully navigated around the northwest end of the atoll and through coral channels to an anchorage four miles south of Tern Island in the lee of the reefs. In the faint light the wreck of the *Carolyn K* could be seen dimly just eastward of the anchorage.

At 0700, Tuesday the 12th, divers, working in shifts, determined the wreck had parted the anchor line and was now held in place only by the mast and rigging being fouled in coral heads on the ocean bottom. A small diesel oil slick was found on the surface with blobs of oil periodically floating to the surface. Using scuba the divers were able to quickly locate the source of the leak (the vent pipes in the diesel tanks) and promptly sealed those off with an epoxy putty. The floating diesel was recovered with oil spill recovery sorbent material, sealed in plastic bags and eventually disposed of in Honolulu.

Divers also found a large section of the bow caved in almost to the crew's bunk room. The fiberglass hull had not torn completely away but was smashed and splintered. The U/W inspection was made difficult by the hundreds of hooks and thousands of feet of heavy fishing line, used in long-line fishing, that were scattered and floating about under the capsized vessel. Marker buoys and their anchor lines and fish nets were also floating up against what had once been the ship's deck. Rotting food and fish, crew's clothing and pieces of loose wooden articles hampered U/W work and made diving both risky and repugnant.

By 0845 divers had cleared away much of the fouled rigging and had placed liftbags under the vessel to float the sunken bow. Air hoses were strung from the *Holo Kai* to the wreck and secured in the open bottoms of the float bags. Soon after the air compressors chattered to life the bow of the *Carolyn K* began to move slowly. Accompanied by an occasional shark and several curious

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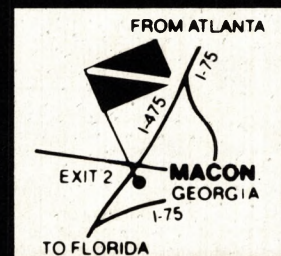
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## TECHNIFACTS

seals, divers Mac and Andy watched the vessel, still upside down, float slowly toward the surface. Instructions to topside crews from the divers, who were wearing bandmask rigs with communication systems, helped keep the floating operation under control.



Resin is applied to the patch. After the patch was secure, the vessel was righted.

When the hull was afloat, upside down but now clear of the bottom, more float bags were rigged by divers to raise the bow section well above the splash of waves. Power saws were used to cut away the smashed section of the fiberglass hull. Power sanders ground away paint and loose resin. After all loose hull material was cleared, a plywood patch was cut and fitted to cover the damaged area. Power drills punched holes through the hull and patch. Bolts were inserted to pull the patch down flush with the hull and to hold it in place. When the plywood patch was bolted securely in place the rough edges were sanded down. Epoxy putty was spread over the cracks between the patch and the hull. When all was ready the entire assembly was sanded smooth. By 1730 the patch was complete. Anchor watches were set on both the wreck and the *Holo Kai*. Float bags were left in place and air pumped into them by the watches to maintain full flotation of the hulk throughout the night.

Early on the morning of the 13th more air hoses were run from the compressors into the engine room and other compartments and air was pumped into them to gain as much flotation as possible. The *Holo Kai* shifted in her mooring to put the wreck in the lee. When the vessel was floating as high out of the water as possible, the hull was sanded free of paint and loose material for a distance of about a foot around the patch. Wooden seams were again epoxy coated to ensure a tight seal. By 0830 the sun was bright and the hull and patch dry. Layers of fiberglass cloth were laid; then roving matt applied to seams. Pre-mixed resin was passed from the *Holo Kai* to the *Carolyn K* via a juryrigged high-line gear.

As the fiberglass crews worked, divers and salvage master Lou Burns worked out a plan for righting the vessel. By 1600 the patch was completed and the fiberglass operation secured. Anchor watches



were set and air was pumped to float bags throughout the night.

At 0700 on the 14th, the crew inspected the patch, found it tight, cured and sealed. Lines were rigged for righting the vessel. Divers rigged a deadman anchor offshore. Lines ran from this to the inshore gunwhales (underwater) of the *Carolyn K*. Other heavy lines were passed from the offshore gunwhales, across the bottom of the hull (at present above water), to the salvage vessel. A strain was put on this gear until all was set up tight. Winches now began straining on these lines and slowly the *Carolyn K* began to right herself. When the slow roll seemed to stop momentarily, a short, sharp surge of power from the *Holo Kai's* engines completed it. At 1155, almost exactly seven days after the vessel sank, the *Carolyn K* was sitting upright in the ocean, but still almost awash.

Float bags were shifted from what was now the inside of the hull to a point under the bow where the divers secured them for another lift. Air was pumped into the bags and, by 1430, the decks of the wreck were awash and pumping of the hull was started. By 1430 the vessel was floating free and divers released the float bags and brought them aboard the salvage vessel.

Decks, bulkheads and all rigging of the *Carolyn K* were covered with diesel, making them slippery and extremely difficult and hazardous for the crews to work on. For the next three hours the crew worked frantically to clean up the vessel.

Early on the morning of the 15th the crew began rigging the *Carolyn K* for towing and at 1100, with two of the divers still on board to keep pumps running and to be available if repairs were needed on the underwater patch, the vessels left French Frigate Shoals for the six day tow to Honolulu.

The *Carolyn K* was drydocked at Keehi Drydock near the American Divers' office. I happened to be there and was impressed with the work the divers had been able to accomplish under difficult conditions. Again, it was apparent that well trained and well qualified commercial divers can perform difficult and unusual underwater tasks safely and expeditiously, when the need arises.

## DIVE MEDICINE WORKSHOP

The Emergency Health and Safety Program of the University of Utah will sponsor a seminar on scuba accident prevention and assessment, victim transportation and treatment, October 5 and 12 in Salt Lake City, Utah. The cost of the course is \$55.

For information contact Ralph L. Brown, Emergency Health and Safety Program, College of Health, University of Utah, Salt Lake City, Utah 84112; (801) 581-8486.

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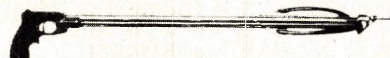
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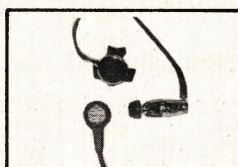




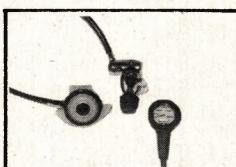
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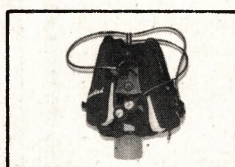
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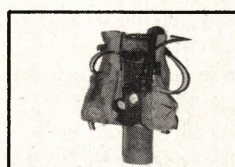
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## DIVING MEDICINE

(Continued from Page 16)

ing the CO<sub>2</sub> from the BC following each detonation. Three or four inflations with air should be sufficient. This should be routine maintenance along with replacing the spent cartridge. It is not necessary, as Donnelly states, to "discard the CO<sub>2</sub> cartridge." It can still be used on the surface—its original purpose. Your buddy's cartridge can be fired at depth if needed.

Donnelly is correct in stating that "breathing a gas other than normal air is very dangerous" and "can kill without warning." This is true of nitrogen and helium. With CO<sub>2</sub>, however, there are strong warnings. One hundred percent CO<sub>2</sub> is so pungent that much of it isn't likely to be inhaled. Even so, a little bit won't hurt you any more than it would in a carbonated drink. There are also strong warnings of a buildup of CO<sub>2</sub> following continued BC rebreathing. That CO<sub>2</sub> percentage won't be nearly enough to taste the pungency, but remember, it's the high CO<sub>2</sub> rather than the low oxygen that gives you the strongest desire to breathe. As the carbon dioxide builds during rebreathing you will be breathing faster. You won't be holding your breath as you ascend.

**BC Maintenance:** In a life and death situation, you certainly won't worry about an unclean BC that might cause a lung infection days later. But you don't want to get sick from practicing either. Rinsing your BC with well-chlorinated tap water may be sufficient, but to be more certain, you can use Zephiran Chloride—not full-strength as stated by Donnelly, but diluted according to directions. Rinse the BC with tap water afterward.

**Too Much Air:** It doesn't seem logical that excess air can be a problem following an out-of-air emergency. But Donnelly is correct. My articles note the possible danger of uncontrolled ascent and breathing from a turgid BC. Both can easily be avoided by exhaling through the nose. As pointed out in this column, it takes more than five full breaths to fill most BCs; and rising from 130 feet, the BC air will expand only five times. As long as the BC flexes, it will not only be safe to inhale from, but will also be an exceptionally easy breather.

**Techniques:** The mouthpieces of most BCs were designed to allow easy purging. That's the reason for the holes in the end. Why not learn to use them and take advantage of this built-in design feature? With this type of mouthpiece, no rolling is necessary. The fractional ounce of water will be expelled easily. (Note: If the hard rubber washer is replaced with soft rubber, it will be much easier to hold the valve closed so water won't enter.)

If you are using a BC mouthpiece with no holes in the end, it can be purged by


rolling (the way the mouthpiece points) so the water will drain into the bottom of the BC. As Donnelly suggests, this will be a problem if you have already given your regulator to an out-of-air buddy. However, there is no reason why you can't save yourself that way.

Rolling completely over is not necessary. Simply rolling slightly will drain the water into the hose corrugations where it will not cause problems unless you inhale forcefully. Breathing air carefully through or over small amounts of water is a skill worth learning.

Handling a panicky out-of-air diver underwater, even with two hands, is dangerous. The exertion may cause *you* to panic. However, there is no reason why a rational diver with no air cannot be helped. He, or you, can inflate *his* BC with air or CO<sub>2</sub> and either his or your weights can be dropped with one hand, if necessary. And, if your BC has a power inflator, you both can breathe *fresh* air to the surface. One diver told me that he once gave his octopus regulator to an out-of-air diver, his primary regulator to another, and all three breathed fresh air going up. European divers regularly practice breathing the fresh air fed into their BCs from the small air bottles attached to them.


I agree with Donnelly that octopus breathing should be taught as one solution to out-of-air problems. However, its limitations must be recognized. Wearing one won't help *you* and your buddy who does have one for you to use is likely to be out of air soon, also. BC rebreathing can save *you or your buddy*.

Donnelly says, "... if your buddy doesn't have an octopus, your next step is buddy breathing and if that fails, the proverbial 'blow and go.'" Donnelly admits that buddy breathing is "difficult to master and more difficult to maintain." Most instructors agree. It has sometimes caused two deaths instead of one. But it has saved lives and is worth learning. Blow and go (exhaling completely on the bottom and then swimming quickly to the surface) was taught long ago but is now known to be dangerous because it causes air to become trapped behind small collapsed airways.

BC rebreathing is a viable source of emergency air. It is easily learned and can save your life. 

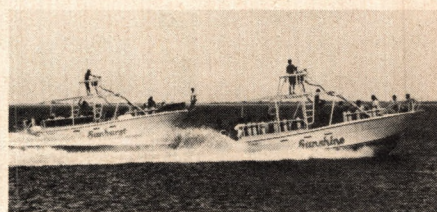
## RUTLEDGE TO NAUI

Valerie Rutledge has been appointed manager of the NAUI South Atlantic Branch, Region 7. She will be headquartered in Miami, Florida. The branch handles NAUI activities in Alabama, Georgia, South Carolina, Florida, the Bahamas, Virgin Islands, Caymans and Puerto Rico.

As an active NAUI and diving promoter, Rutledge was instrumental in the *Proteus* project, which involved the sinking of a wrecked vessel as an artificial reef in the Dade County area of Florida. 

## DIVE BONAIRE FLEET


Dive Bonaire has recently taken delivery of two more dive boats—the *Sunshine* and *Sunburst*. The two, 36 foot boats



complete the addition of four new 36 foot boats to Dive Bonaire's fleet, which now totals eight.

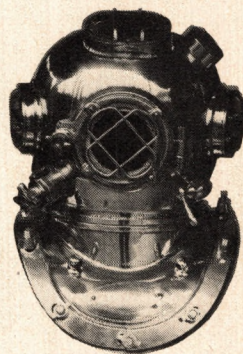
With custom built control towers and tank racks from Marine Island Products, Vero Beach, Florida, and twin turbo charged 225 hp Ford Lehman diesel engines, the boats ensure a maximum of safety, comfort and convenience. Capable of speeds in excess of 24 knots, these boats make the remote and virgin diving areas of Bonaire's more distant north and south coasts accessible on a daily basis.

The latest two boats, along with their sister vessel, *Sunset*, have been specifically designed to accommodate the two tank dive format necessary for the all day trips to Washington/Slaggbai Park.

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# Diving News From Down Under Reef Explorer to Papua New Guinea

TEXT AND PHOTOGRAPHY BY GERI MURPHY

For the second year in a row, Australia's best known live-aboard dive boat, the *Reef Explorer*, is scheduling a series of exploratory dive trips to Papua New Guinea. This is regarded as one of the most remote and unusual islands of the world. It is the home of primitive stone age tribes who speak 700 different languages; the mud men; and coastal tribes who worship sharks.

The *Reef Explorer*, skippered by Kerry Pietsh, will operate four different live-aboard dive cruises along Papua New Guinea's northern coast from January to April 1986. The 63 foot vessel can accommodate up to 12 divers comfortably. Designed specifically for long distance cruising, it is fully equipped with satellite navigation electronics, sidescan sonar and sophisticated radio equipment.

For diving, the *Reef Explorer* is equipped with a large stern dive platform, two air compressors, an air fill station on the afterdeck and special seating and storage for divers who are gearing up. The ship also features comfortable double cabins, a dining saloon and fully air-conditioned quarters. The vessel normally operates cruises to the Coral Sea and along the Great Barrier Reef.

## PAPUA NEW GUINEA

Papua New Guinea is approximately 700 miles north of Australia's Cape York. To reach this remote area, guests fly from the United States to Sydney, Australia aboard the Qantas transpacific flight with an overnight stay in Sydney. The next day they fly from Sydney north to Port Moresby, again aboard Qantas. At Port Moresby, guests then board an Air Niugini flight to Madang.

The diving portion of the trip consists of 12 days among the coral reefs and shipwrecks of Papua New Guinea's north coast. An estimated 500 ships and aircraft are believed sunk in these waters as a result of fierce battles during WW II. Explorations of these wrecks and nearby coral reefs are the result of co-owner Barry May's previous experience in WW II salvage in the same area. Also, the *Reef Explorer* crew has teamed up with Papua New Guinea's resident diving expert, Bob



The 63 foot, live-aboard *Reef Explorer*, captained by Kerry Pietsh (above right), will make four cruises to Papua New Guinea from January to April. The vessel is fully equipped with electronic navigation aids and can comfortably accommodate 12 divers.

Halstead, of Tropical Diving Adventures.

The *Reef Explorer's* first cruise, February 10-21, will cover the area from Alotu to Rabaul. The second cruise, February 23 to March 6, will cover the wrecks and reefs from Rabaul to Lorengau. The last two cruises of the season are scheduled for March 9-20 and March 23 to April 4. These trips will explore the reefs and wrecks from Madang to the Hermit and Ninigo Islands.

On a typical trip such as the March 9-20 excursion from Madang, the *Reef Explorer* will visit such sites as The Hook, an offshore coral reef in the shape of a large hook. The next stop would be The Arch, a small enclosed coral lagoon with a magnificent archway rising out of the water on the seaward side.

The next site on the cruise would be the Destroyer Wreck, a 240 foot WW II American destroyer that sits upright in 120 feet of water. An optional stop along the way could be Hansa Bay, the site of a fierce WW II battle. An estimated 10 shipwrecks lie on the bottom of this bay at an average depth of 60 feet.

From Hansa Bay, the *Reef Explorer* steams seaward toward the Hermit and Ninigo Islands. These are two small groups of remote, uninhabited islands, approximately 100 miles offshore. Average underwater visibility is 125 feet and the area offers spectacular diving oppor-



tunities on virgin reefs. The crew of the *Reef Explorer* has already made a number of fascinating discoveries in the area including a manta ray cleaning station; giant schools of Pacific barracuda; strange looking bright yellow sponges in the shape of cabbage leaves and measuring five feet tall; and awesome 10 foot tall pipe coral trees. The area is an absolute wonderland for the underwater photographer, offering a number of excellent opportunities for photographing rare fish. Dive guests have already encountered such unusual creatures as: the dragon scorpionfish; bright pink stonefish the size of a football; and the rare "sun, moon and stars angelfish."

For more information about booking dates and prices for the *Reef Explorer*, contact Dive In Australia, 680 Beach St., Suite 340, San Francisco, CA 94109; telephone (415) 928-4480.



## WRECK FACTS

(Continued from Page 14)

wrecks in the Philippines. *Diver's Guide to the Philippines* describes both wrecks and other dive sites. The book may be ordered from Diving Publications, 4424 N. Woodward, Royal Oak, MI 48072.

Ralph Descheneaux asks about wrecks off New Hampshire and where to find information on careers in marine science. In *Search of Shipwrecks* by Jim Jenney lists several New Hampshire wrecks. In addition, Jenney has a shipwreck data bank full of thousands of wrecks off New England and the East Coast. Contact Jim Jenney, P.O. Box 144, Saunderson, RI 02874. For careers, try International Oceanographic Foundation, 10 Rickenbacker Causeway, Virginia Key, Miami, FL 33149. Ask for the booklet, Training and Careers in Marine Science. Also write to Director, National Sea Grant Program, National Oceanic and Atmospheric Administration, Rockville, MD 20852. Ask for University Curricula in the Marine Sciences and Related Fields.

Rolando Salerno writes all the way from Lima, Peru, asking for information on shipwrecks along the Peruvian coast in the South Pacific. Rolando says: "I have located, in waters not far from Lima City, what appears to be parts of a big wreck, possibly a Spanish galleon. Can you send me ideas on how to identify this vessel?" Wrecks that old, Rolando, without a name, are tough to identify. Sometimes they're tough even when you know their identity. Robert Marx, in his book *Shipwrecks in the Americas*, lists 25 wrecks from 1586 to 1823, all off the west coast of South America. This is a starting point for you. Actually, the archives in Seville would be your best bet, but that would entail time and money for an extended trip to Spain.

Safe diving to all. Be sure to include a stamped, self-addressed envelope when writing: Ellsworth Boyd, 1120 Bernoudy Rd., White Hall, MD 21161.

## SCUBALAB PROVO

Scubalab Provo, a division of Research Submersibles Ltd., is now in full operation under the direction of Dennis Denton. On staff are two PADI instructors and three PADI divemasters. Scubalab operates the diving for the recently opened Club Med Turkoise and the Island Princess Hotel, which are on Provo in the Turks and Caicos Islands.

The Island Princess is offering two new dive packages in conjunction with Scubalab including accommodations, meals, diving and airport transfers.

For more information contact: (in U.S.) Scubalab Provo, P.O. Box 52-6002, Miami, FL 33512.

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Advertising rates: \$153.00 for three consecutive ads, \$264.00 for six consecutive ads, \$396.00 for a full year. DEADLINE: 28th of 3rd month prior to publication. PAYMENT MUST ACCOMPANY COPY. Send all material to: Diver's Directory, c/o Direct Response Advertising, P.O. Box 69910, Los Angeles, CA 90069.

## ALABAMA

MCWHORTER ENGINEERING CO. 205/836-2814  
1220 Westpark Dr., Little Rock, AR 72204  
Rebuilds, parts, accessories, ASME coded.  
HP air compressors, units, systems, since 1952.

## ARKANSAS

LYNN'S SKI 'N SCUBA, INC. 501-666-DIVE  
1220 Westpark Dr., Little Rock, AR 72204  
50' dive boat, equip. rentals, Arkansas' only scuba dome  
featuring 14' deep diving pool. PADI instr., dive trips.  
RICK'S PRO DIVE'N SKI SHOP, INC. 501/753-6004  
2323 Poplar St., N. Little Rock, AR 72114  
Arkansas' only PADI 5 star training facility w/indoor pool. Dive  
boat, dive vacations. We teach 9 PADI specialties.

## CALIFORNIA

AQUATICS OF SANTA BARBARA 805/964-8689  
5370 Hollister Ave., #3, Santa Barbara, CA 93111  
Channel Islands Charter, rentals, sales, repair, air.  
Instruction: SSI, NAUI, PADI beginning to Divemaster courses.  
ARGO DIVING SERVICES 213/510-2208  
79 Canyon Terrace, P.O. Box 1201, Avalon, CA 90704  
Guided underwater tours and instruction by  
Jon Hardy on Catalina Island. Free information.  
CATALINA DIVERS SUPPLY 213/510-0330  
Avalon, Catalina Island, CA 90704  
Rentals, sales, air, 2 locations.  
Pleasure Pier and Avalon Underwater Park.  
CATALINA UNDERWATER CONNECTION 714/661-0320  
P.O. Box 135, Dana Point, CA 92629  
Custom boat charters, guided U/W tours, 6 divers max.  
PADI open water & specialties instruction, rentals.  
OPENWATER HABITAT, INC. 714/633-7283  
417 S. Main, Orange, CA 92668 CA 800/334-OHMS  
Centrally located. PADI 5 Star instructor devel. centre.  
Beginner to instructor courses, pro mtis/sls/svs, dv. trips.  
PACIFIC CAMERA SERVICE 714/642-7800  
730 W. 19th St., Costa Mesa, CA 92627  
Nikonos cameras & flash repairs. 24 & 48 hr.  
service available. Custom modifications.  
PASADENA DIVERS WEST 213/796-4287  
2695-A E. Foothill Bl., Pasadena, CA 91107  
Sales, service, air, PADI, NAUI, instruction.  
Rentals, boat trips, underwater photography, tours.

PROFESSIONAL S.C.U.B.A. REPAIR 818/769-1484  
5725 Cahuenga Bl., No. Hollywood, CA 91601  
Professional repair is our only business.  
Servicing all makes and models of equipment since 1961.  
SCUBA DUBA DIVE 818/881-4545  
7126 Reseda Bl., Reseda, CA 91335  
Mon.-Sat.: 10-7. Underwater photo specialist.  
Boat trips, instruction, sales, service, rentals.  
TRI-VALLEY SCUBA SCHOOL, INC. 415/828-5040  
21310 San Ramon Valley Bl., San Ramon, CA 94583  
Scubapro Dealer & full line of major brands.  
The East Bay's 'full service' pro dive store.  
WATER EDUCATION TRAINING (WET) 619/578-3483  
8176 Miramar Rd., San Diego, CA 92126  
YMCA, PADI, NAUI, resort courses through instr. Free weekly  
scuba refresher courses. Full service vacation facility. Get WET.

## CONNECTICUT

ORBIT MARINE SPORTS CENTER, INC. Open all year!  
3273 Fairfield Ave., Bridgeport, CT 06605 203/333-DIVE  
Foot of Broad St., Stratford, CT 06497 203/377-6969  
Sales, rentals, air, service, NAUI, PADI instr., charters.  
THE DIVING BELL 203/775-3573  
782 Federal Rd., Brookfield, CT 06804  
Open all year. 5 Star PADI, instruction, equipment rental, hydros,  
photo, repairs, gifts. Travel with us. Local & island travel planned.  
UNDERWATER SWIMMERS, INC. 203/932-0258  
526 Main St., West Haven, CT 06516 203/828-3641  
1038 Farmington Ave., Kensington, CT 06037  
Discount prices, courses, rentals, repairs, air, hydros.

## FLORIDA

AMERI DIVE 305/395-4407  
7166 Beracasa Way, Boca Raton, FL 33433  
Del Mar Shopping Village, corner Powerline & Palmetto.  
Instr., sls., rental, svcs., air, travel, resorts, Scubapro, PADI.  
BRENT FEINMAN'S SCUBA WORLD 'STAY WET' 305/587-DIVE  
3932 Davie Bl., Ft. Lauderdale, FL 33312 305/587-7234  
PADI facility, air, sales, service, rentals, dive charters,  
reef trips. All levels of cert. private & group lessons.  
CRYSTAL LODGE MOTEL & DIVE CENTER 904/795-6798  
US 19 N., P.O. Box 456, Crystal River, FL 32629  
Manatee & spring diving, boats, equipment rental.  
Heated pool, seafood, bar, rooms at low prices.  
DEEP SIX DIVE & WATERSPORTS Beach Diving Report  
1550 Old Dixie, Vero Beach, FL 32960 305/562-2883  
Closest beach dive to Disney, reef within 50 ft. of beach.  
Lobster, wreck, treasure, PADI 5 star IDC full svcs. store.  
DIVER'S DEN/PNEUMATIC SYSTEMS, INC. FL 904/871-4777  
4720 E. Bus Hwy. 98, Panama City, FL 32404 800/272-4777  
Sales, rentals, service, fast charter boats, 6-15 passengers  
Instr. NAUI, PADI. Compressor sales, service, maint., overhaul.  
DIVERS UNLIMITED 305/981-0156  
6023 Hollywood Bl., Hollywood, FL 33024  
Awarded #1 training facility by PADI. All brands, whsl/retl, daily boat  
trips, repair, rental, classes, travel. 5 Star PADI training facility.  
DIVERS UNLIMITED/FORT LAUDERDALE 305/524-4862  
440 Seabreeze Bl., Ft. Lauderdale, FL 33316  
Daily boat trips, training dives, classes, retail-all brands, ibisure-  
wear, rentals. Packages w/Days Inn. 5 Star PADI training facility.  
DIVERS WORLD 305/844-1510  
Mail: 200 Tacoma Ln., PBS, FL 33404  
Daily dives, group rates, rentals. One day  
Bahama trips. Coast Guard approved 34' boat.  
DIXIE DIVERS  
Of Ft. Pierce, 1717 S. U.S. 1, FL 33450 305/461-4488  
Of Stuart, 1843 S.E. Federal Hwy., FL 33494 305/283-5588  
PADI 5 Star IDC facility. Open 7 days, full service.  
FANTASEA SCUBA HEADQUARTERS 904/837-0732  
P.O. Box 63, #1 Hwy. 98, Destin, FL 32541  
PADI 5 Star facility, D.V.I. resort destination.  
Sales & service, charters, instruction, rental, air.  
FORCE-E, 1399 N. Military Trl., W. Palm Bch., FL 305/471-2676  
877 E. Palmetto Pk. Rd., Boca Raton, FL 305/368-0555  
2700 E. Atlantic Blvd., Pompano Beach, FL 305/943-4483  
2104 W. Oakland Park Blvd., Ft. Lauderdale, FL 305/735-6227  
GINNIE SPRINGS, INC. 904/454-2202  
Rt. 1, P.O. Box 153, High Spring, FL 32643 800/874-8571  
Six 72" clear blue springs, camping, canoeing.  
Complete resort dive facility. Cavern instruction.  
GULF STREAM DIVER SCUBA CHARTERS 305/965-7878  
2315 Caroma Ln., West Palm Beach, FL 33406  
Palm Beach daily reef & wreck dives, pro. charters,  
Bahama boat trips. 2 new USCG 38' & 41' cust. dv. boats.  
HYDROSPACE DIVE SHOP 800/874-3483  
3605-A Thomas Dr., Panama City Beach, FL 32407 904/234-9463  
The Gulf Coasts' largest and most experienced dive service.  
5 boats 46', 42', 40', 24'. Full service facility.

LAUDERDALE DIVER 305/GO-SCUBA  
1334 S.E. 17th St., Ft. Lauderdale, FL 33316 "on the Causeway"  
Complete master diver program. PADI distinguished service  
award. Instr., sales, service, air, photo, trips. Widest selection.  
MAC'S SPORTS 813/442-9931  
2126 Drew St., Clearwater, FL 33575 813/461-7160  
One of the world's largest diving stores & school.  
Pool on premises, local & Caribbean trips.  
NORINE ROUSE SCUBA CLUB OF THE PALM BEACHES  
4708 N. Dixie Hwy., West Palm Beach, FL 33407 305/844-2466  
A membership club for certified divers.  
Dive trips 6 days a week.  
PLANTATION INN MARINA 904/795-5797  
P.O. Box 1093, Crystal River, FL 32629.  
Instruction, rentals, boats, canoes, pkg. deals, pvt. Manatee obser.  
deck and air sta. at Divers Giant Spring. Golf, tennis, 150 rooms.  
PROFESSIONAL DIVING SCHOOL/CHARTERS OF FLORIDA  
Bahai Mar Yachting Center, Ft. Lauderdale, FL 33316  
Basic-divemaster training/specialties-night, deep, wreck.  
Daily reef & wreck dives. 305/761-3413 800/772-DIVE  
'SCUBA TOO' CAPT. JOE SCHIRCK 305/989-5813  
Ft. Lauderdale's oldest continuing dive operation. Pet &  
feed Oliver the Moray Eel featured on "Those Amazing Animals".  
PADI instructor on every dive, 6 persons maximum.  
SPANISH BAY VILLAS ONE BR CONDO for Sale at Great Price.  
Own a place in the sun, with the best diving under the sun.  
Fully-managed income property with complete dive shop  
facilities right next door. Call Florida 305/941-2286  
THE SCUBA SHACK, INC. 305/334-8808  
2485 N.E. Dixie Hwy., Jensen Beach, FL 33457  
The Treasure Coast's oldest full service dive shop.  
PADI instruction, air, sales, rentals, repairs, trips.  
VORTEX SPRING & CAMPGROUND, INC. 904/836-4979  
Rt. 2, P.O. Box 18 1/2, Ponce de Leon, FL 32455. Now ITC courses.  
Sales, service, rentals, 5000 PSI air, canoe rentals, group lodging  
dorms, RV hook-ups. Cavern & system dive. Gulf & Keys trips.

## FLORIDA KEYS

A KEY LARGO CONDO Call collect 813/939-3612  
Moon Bay deluxe 2 BR, 1 1/2 bath w/dock, sleeps 6. Near  
Pennekamp, dive centers, marinas and Largo cut. Scuba,  
snorkel, fishing, skiing, tennis. \$395 per wk. Reserve early.  
AMERITRAVEL DIVING PACKAGES US & FL 800/551-4000  
5900 SW 73 St. #204, S. Miami, FL 33143  
Unique dive packages anywhere in the keys.  
Custom tailored to any budget, individuals or groups.  
AQUATIC FLOATING SEA COVE MOTEL 305/289-0800  
12685 Overseas Hwy., Marathon, FL 33050  
Budget rates, Summer \$14-\$29, Winter \$19-\$39 for two.  
Private deep harbor & ramp on Atlantic. A#1 rooms and effs.  
BUDDY'S DIVE SHOP 305/664-4707  
P.O. Box 409, Islamorada, FL 33036 MM. 79.5 Bud 'n Mary's Marina  
Dv. aboard our 40' 'Scuba Safari' & 34' 'Free 'n Clear'. Full/1/2 day  
trips to Alligator Reef, Cannibal Cruiser & Coral Gardens. Pkgs. avail.  
CAPT. CORKY'S DIVERS' WORLD of Key Largo, Inc. 305/451-3200  
P.O. Box 1663, Key Largo, FL 33037 MM. 99.5 U.S. 1 past Wendy's  
Bahamas/Pennekamp, U/W video rental, snkl. w/dolphins, PADI instr.,  
grp. rates, dive, snkl., sail, shell collect, spearfish. Best pkg. rates!  
CAPT. GREG'S SCUBA-DO 305/451-3446  
P.O. Box 2237, Key Largo, FL 33037 MM.100 @ 100 Marina  
Dive Pennekamp, 34' boat, 6 max. Avoid crowded boats.  
Enjoy personal service. We dive with you. Best dive pkg. rates.  
CAPT. SLATE'S ATLANTIS DIVE CENTER 305/451-3020  
51 Garden Cove Dr., Key Largo, FL 33037 MM.106.5 305/451-1325  
Dive Pennekamp on 1 of 3 cust. boats. NAUI, YMCA, PADI, CMAS  
instr. Air & mtis., grp. & multi-dv. disc., pkgs., gifts.  
CORAL LAGOON RESORT AT THE DIVING SITE 305/289-0121  
Middle Keys, MM.53, 12399 Overseas Hwy., Marathon, FL 33050  
Waterfront efficiency cottages, dockage, pool, tennis, bikes.  
PADI dive shop, lessons, 3 boats, groups, spring/fall dive pkgs.  
DIVE KEY WEST 305/296-3661  
'Carol J', P.O. Box 2842, Key West, FL 33045  
Disc. room pkg. & grp. rates. Max. 6 divers.  
Lobster diving & spearfishing, rentals, air.  
FLORIDA KEYS DIVE & SKI, INC. 305/852-4599  
P.O. Box 391, Tavernier, FL 33070 6 pass. dive boats.  
A PADI scuba train. fac. Checkouts, 4 day cert. course  
& all levels of instr. Spearfishing, shelling, watersports.  
HALL'S DIVING CENTER & RESORTS 305/743-5929  
1688 Overseas Hwy., Marathon, Keys 33050  
Guaranteed "Weather-Proof" reef trips and dive packages.  
Lessons start every day. All major brands and credit cards.  
HAWK'S CAY RESORT & MARINA US 800/327-7775  
MM 61, Marathon, FL 33050 FL 800/432-2242  
Tennis, pools, jacuzzis, reef trips, PADI. 305/743-7000  
Custom-built dive boats, air/equip. rental, instr., pkg. rates.  
HOLIDAY ISLE DIVE & SWIM CENTER 305/664-4145  
P.O. Box 482, Islamorada, FL 33036 MM 84.5 FL-800/432-2875  
New dive boat. US-800/327-7070  
Group rates and scuba instruction.



KEY LARGO CONDO	305/433-8073
3 BR., 1 1/2 Bath, completely furnished.	305/546-2275
Marina, saunas, tennis, pools, 2 mi. Pennekamp Park.	
Great diving, fishing, sailing. Special summer rates.	
KEY LARGO BAYFRONT HOME—Dive, Snorkel-Sail	305/255-4556
P.O. Box 161414, Miami, FL 33116	
3 bedroom/2 bath gorgeous, new, private home with dock.	
Luxuriously furnished, fantastic rates from \$11/day/per./wk.	
KEY LARGO LUXURY CONDO	513/984-0866
Oleinik, 8555 Blue Cut Ln., Cincinnati, OH 45243	
Luxuriously decorated, 2 bedroom, dock, pool, sauna, tennis. Minutes from best dive areas.	
KEY WEST PRO DIVE SHOP, INC.	305/296-3823
1605 N. Roosevelt Bl., Key West, FL 33040	
Instruction, sales, service, charters, air.	
Private instruction and open water checkouts.	
LADY CYANA DIVERS	305/664-8717
P.O. Box 1157, Islamorada, FL 33036 MM 85.9	
Daily reef trips aboard our 40' and 60' custom dive boats.	
Rentals, air, sales, service, instruction, group rates, packages.	
LOOE KEY REEF RESORT & MARINA	305/872-2215
P.O. Box 509G, Ramrod Key, FL 33042 MM.27	
Singles, doubles, tv, pool, spa, restaurant, ramp, dockage.	
Compl. dive shop, instr., USCG cert. custom dive boat, grp. rates.	
PENNEKAMP STATE PARK CONCESSION	305/451-1621
Box 13M, MM 102.5, Key Largo, FL 33037	800/432-2871
The only dive shop located directly in Pennekamp.	
Free brochure, send 50¢ for reef chart.	
PLANTATION KEY LUXURY CONDO	305/852-5748
c/o Plantation Villas, Box 17, Tavernier, FL 33070	
Beautiful 1 BR condo (sleeps 4) on bay. Has everything.	
Boat ramp & docks. \$295/wk. May-Nov., \$350/wk. Dec.-Apr.	
QUIESCENCE DIVING SERVICES, INC.	305/451-2440
P.O. Box N-13, Key Largo, FL 33037 MM. 103.5	
Personalized charters in Pennekamp, only 6 divers per boat.	
Instruction; Basic, Advanced, Specialty courses.	
RENT 20' FLORIDA KEYS DIVE BOAT	305/743-0391
and stay aboard 46' luxuriously furnished, color tv, A/C	
houseboat at small private island. Dive Pennekamp, Looe Key	
Alligator Reef, Crystal dive water. \$695 week.	
RENT 28' FLORIDA KEYS DIVE BOAT	305/852-9076
Dive all the Keys hot spots from this fast, comfortable,	
twin engine dive boat. Sleep aboard 4, galley, shower,	
A/C, flybridge, dive platform, boarding ladder, \$795 wk.	
ROCK REEF RESORT	305/852-2401
P.O. Box 73, Key Largo, FL 33037 MM. 98	
Divers Paradise, spacious grounds, beach, jacuzzi,	
comfortable accommodations and comfortable prices.	
SEA CENTER DIVE SHOP	305/872-2319
P.O. Box 515, Big Pine Key, FL 33043 MM. 29.5	
Dive Looe Key, custom boats, dive/lodging packages.	
PADI facility, full service shop, 24 hr. hydro.	
SEA DWELLERS SPORTS CENTER	305/451-3640
99850 Overseas Hwy., Key Largo, FL 33037	
Dive and snorkel Pennekamp Park.	
Special weekday rates.	
SEA TRAIL MOTEL	305/852-8001
Rt. 5, P.O. Box 91, Key Largo, FL 33037, MM 98.5	
Cable TV, air conditioned, refrigerator, budget rates,	
10% discount. Advanced reservations May through Nov.	
SEAFARER RESORT MOTEL	305/852-5349
P.O. Box 185, Key Largo, FL 33037 MM. 97.8 (Gulfside)	
'Fantasy Island' setting, real sandy beach & free paddle boat.	
Clean rooms & efficiencies. Please contact us for group rates.!	
SHORELINE MOTEL	305/664-4027
Rt. 1, Box 57, Islamorada, FL 33036 MM. 81	
Low rates, clean rooms, cable TV, refrigerators,	
beach, free dockage and boat ramp.	
STEVE KLEM U/W GUIDE SERVICE	305/451-1831
P.O. Box 1803, Key Largo, FL 33037 MM. 104	
Dive with the legendary "Pied Piper of Pennekamp Park".	
Let Steve introduce you to his U/W pets. 6 divers only.	
THE BOAT, a div. of Triangle Watersports, Inc.	305/745-BOAT
Rt. 2, Box 617, Summerland, FL 33042	
Free color brochure, customized dives, adventure experiences,	
instruction, U/W video, Looe Key (FL Keys), Belize(Central America).	
THE DIVING SITE, INC.	US 800/634-3935; FL 800/821-9155
12399 Overseas Hwy., Marathon, FL 33050 MM. 53.5	
30, 16 & 6 pass. dive boats. Daily reef trips.	305/289-1021
Charters & group rates, PADI lessons, sales, repairs, dive pkgs.	
THE REEF AT MARATHON RESORT CLUB	US-800/327-4836
P.O. Box 871, Marathon, FL 33050	FL-305/743-7900
2 BR/2 BA villas, efficiencies, motel rooms, tennis, pool,	
clubhouse & marina. Dive pkgs. & mtl. boats avail.	

## GEORGIA

DIVERS SUPPLY	912/474-6790
5208 Mercer Univ. Dr., Macon, GA 31210	
PADI training facility, all major brands.	
Located at exit 2 on I-475	

DIVING WORLD USA	404/634-4354
2945 Buford Hwy., Atlanta, GA 30329	
All brands, wholesale, retail, repair, rental, trips.	
YMCA, NAUI, PADI classes. 3 man chamber.	

## HAWAII

ALOHA DIVE SHOP—KOKO MARINA	808/395-5922
Honolulu, HI 96825	808/395-8882
"Diving is fun" with Jackie and her friends.	
Scuba resort cert., tours, boat, sales, rental, all cert.	
CAPT. NEMO'S OCEAN EMPORIUM	808/661-5555
700 Front St. & Dickenson, Lahaina, Maui, HI 96761	800/367-8088
1st class diving & sailing, compl. shop: sales, rentals & cameras.	
58' catamaran, 26' cruisers, small grps., complete dive packages.	
CENTRAL PACIFIC DIVERS	808/661-8718
780 Front St., Lahaina, Maui, HI 96761	
2 & 3 tank trips daily to Hawaii's top spots.	
4 & 5 day scuba classes. Request info from Maui's best.	
CUSTOM DIVE SERVICE	808/572-0245
P.O. Box 90, Makawao, Maui, HI 96768	
'Windward side' scuba charters for only the very healthy, very experienced & well equipped diver. Write for application & details.	
DIVE KAUAI	808/822-0452
976 Kuhio Hwy., Kapaa, Kauai, HI 96746	
Kauai's largest sport & commer'l facil., disc. prices, sales, mtl., free air, PADI, NAUI cert., sm. pers. char., indiv. & grp. pkgs.	
DIVE MAKAI CHARTERS	808/329-2025
P.O. Box 2955, Kailua-Kona, HI 96745	Priv. PADI instr.
Diving with a difference, we care! Write to Tom & Lisa.	
Rated Kona's best every year since '76 by Undercurrent.	
DIVE MAUI INC.	808/667-2080 or 661-4363
Lahaina Market Pl., Lahaina Luna Rd., Lahaina, HI 96761	
Full service NAUI, PADI, SSI store. 3 boats leaving daily for Maui, Lanai, Molokini. Free maps. Photog. avail.	
FATHOM FIVE DIVERS	808/742-6991
P.O. Box 907, Koloa, Kauai, HI 96756	
Specializing in small personal charters, daily trips.	
NAUI and PADI instruction, air, rentals, photography.	
HAWAIIAN WATERCOLORS	808/879-3584
P.O. Box 616, Kihei, Maui, HI 96753	
Experts in dive charters, U/W video, U/W photography.	
Contact Ed Robinson for information.	
KALIA HOTEL	808/922-1961
2164 Kalia Rd., Waikiki Beach, Honolulu, HI 96815	
Waikiki's most reasonable rates. Std., deluxe and penthouse rooms available, some with cooking facilities.	
KONA COAST DIVERS	808/329-8802
75-5614 Palani Rd., Kailua-Kona, HI 96740	
Kona's finest daily charters, priv. PADI/NAUI instr.	
Retail, rentals, air & vacation pkg. available. Write today.	
LAHAINA DIVER'S INC.	800/367-8047 ext. 102
710 Front St., Lahaina, Maui, HI 96761	808/667-7496
Daily trips aboard 2 fastest, most comfortable boats in Hawaii. Most personable staff. Maui's only PADI 5 Star.	
LEEWARD DIVE CENTER	808/696-3414
85-979 Farrington Hwy., Waianae, HI 96792	
3 boats daily with over 50 different dive sites. Dive the Mahi, 165' wreck, the plane, turtles & all in small groups.	
MAUI DIVE SHOP	808/879-3388
P.O. Box 1018, Azeka Place, Kihei, HI 96753	
Send for free Maui Diver's Guide, enclose \$1 postage.	
Dive charters to Molokini, rentals, 5 day scuba classes, windsurfing.	
MIKE SEVERNS SCUBA DIVING	808/879-6596
P.O. Box 627, Kihei, Maui, HI 96753	
Small groups, 5 cert. divers max. Guided boat dives.	
Two person privates w/Tekna DVX3 scooters.	
OCEAN ACTIVITIES CENTER	808/879-4485
3750 Wailea Alanui, D-2, Wailea, HI 96753	
Hawaii's only dive lodge: Hotel Lana.	
Daily dives to Molokini, La Perouse, Kahoolawe, Lanai.	
OCEAN ADVENTURES, INC.	808/487-9060
98-406 Kam. Hwy., Pearl City, HI 96782	
PADI 5 Star instructor dev. center, diver vehicles, tours, group pkgs., boat dives, cameras, 3/4 day certs.	
OCEAN SPORTS North Kona Coast	
Sheraton Waikaloa Hotel, P.O. Box 3291 WVS, Kamehala, HI	
Fantastic diving & sailing, windsurfing lessons & rentals.	
42' catamaran, Zodiac Dives, camera rentals, small groups.	
SANDWICH ISLE DIVERS	808/329-9188
73-1263 Lihau St., Kailua, Kona, HI 96740	808/325-7723
Kona-Hawaii's best. Enjoy it with us. Daily trips. Small charters. PADI instruction. Night dives, too. Call or write.	
SEA DREAMS HAWAII	808/329-8744
P.O. Box 4886, Kailua-Kona, HI 96745	808/322-6118
Fast, comfortable custom dive boat. 2 to 6 divers. 1 trip daily. 1st class equipment, friendly service. PADI instr.	
SEA PARADISE, SCUBA	808/322-2500
P.O. Box 5655, Kailua-Kona, HI 96745	
Kona's best charter company. Explore reefs, lava tubes & archways.	
Our 'pampered diver' service will spoil you forever. PADI & NAUI.	

SOUTH SEAS AQUATICS	808/538-3854
1050 Ala Moana Bl., Honolulu, HI 96814	808/538-3856
Dive the Mahi, 165' shipwreck and lava tubes! Daily boat charters.	
Full service pro dive store since 1961. Write for free brochure.	
THE DIVE SHOP OF KIIHI LTD.	808/879-5172
1975 S. Kihei Rd., Kihei, Maui, HI 96753	
Daily dive & sn. to Molokini, 3-5 day cert. op. water check-outs	
Full svc. facility, Maui Divers Guide 6.95 + P & H.	
WAIKIKI DIVING, INC.—WAIKIKI DIVING SCHOOL	808/922-7188
420 Nuhua St., Honolulu, HI 96815	808/922-7189
Waikiki's only pro dive shop. PADI & NAUI facility.	
Boat dives, sales, rentals, charters. Free brochure.	

## ILLINOIS

THE GEAR BAG, INC.	312/637-FINS
1605 N. Newland, Chicago, IL 60635	
Located at 6900 west on North Avenue.	
NAUI pro facility & PADI training facility.	

## INDIANA

SCUBA LAKE MICHIGAN CHARTERS	219/287-2223
Capt. Ernie Piotrowski, 234 N. Albert St., S. Bend, IN 46619	
Dive aboard Sea Quest II, Club/shop rates, rentals.	
Special Thur. & Fri., 5-tank charters, discount program.	

## LOUISIANA

SEA HORSE DIVING ACADEMY	504/246-6523
5400 Crowder Bl., Unit E, New Orleans, LA 70127	
Pro dive center PADI 5 Star training facility.	
Classes-Beginner-instructor. Indiv. & group vacations.	

## MAINE

AQUA CITY SCUBA, INC.	207/873-0266
11 Water St., Waterville, ME 04901	
Sales, in-shop repair service, rentals, NAUI & PADI training facility. Central Maine's largest dive shop.	
TOMMY'S HARDWARE—TOMMY'S DIVE SHOP	207/772-5357
273 Congress St., Portland, ME 04101	
N.E.'s largest, known coast to coast, slis., svcs., mtl., air, hydro.	
YMCA, NAUI, PADI, wreck charters, mail order, discount prices.	

## MARYLAND

DIVERS DEN, INC.	301/668-6866
8105 Harford Rd., Baltimore, MD 21234	
Maryland's oldest professional dive shop.	
Large enough to serve you — Small enough to know you.	
DYNAMO DIVE SHOP	301/474-6380
8906 Rhode Island Ave., P.O. Box 1019, College Park, MD 20740	
N.C. wreck dives, Florida trips, full service dive shop,	
PADI 5 Star, instruction, 24 hour wetline: 345-DIVE.	
TIDEWATER AQUATICS	301/268-1992
1315 Forest Dr., Annapolis, MD 21403	
Full service pro dive store & skin diving school.	
Authorized Scubapro dealer & warranty service center.	

## MASSACHUSETTS

AQUARIUS DIVING CENTER, INC.	617/759-DIVE
3239 Cranberry Hwy., Buzzards Bay, MA 02532	
Authorized Scubapro dealer. PADI instruction, sales, full service, rentals, dive travel. Mon-Fri. 10-8, Sat. 9-5, Sun. 8-1.	
CAPE COD DIVERS, INC.	617/432-9035
815 Main St., Harwich Port, MA 02646	MA 800/DIVING-1
Sales, service, air, professional instruction.	
2 USCG approved diveboats and captains.	
LOWELL SCUBA CENTER	617/453-7574
477 Gornham St., Lowell, MA 01852	
Full service pro store, instruction all levels.	
Authorized Scubapro dealer.	
NORTHEAST SCUBA, INC.	617/774-7296
125 Liberty St., Danvers, MA 01923	
Scuba instruction, sales, air station, photo courses.	
Hydro test, regulator repairs, rentals, boat charters.	

## MICHIGAN

SCUBA NORTH, INC.	616/947-2520
13258 W. Bayshore Dr., Traverse City, MI 49684	
NAUI instruction, rentals, repairs, hydro's,	
3500 PSI, charter boat, trips, Dacor, USD, Scubapro.	



WOLF'S DIVER'S SUPPLY 616/926-1068  
250 W. Main, Benton Harbor, MI 49022  
Discount prices, service, rental, instr., air, travel, USD.  
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THE SUPERIOR DIVER, INC. 218/724-4655 or 475-2550  
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Shipwreck diving charters in the Isle Royale National  
Park aboard the 'Royale Diver' & 'Superior Diver'.

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Fully illuminated underground lake, 1 hour from reservations  
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11004 Manchester Rd., St. Louis, MO 63122 314/822-3005  
39 N. Allen, Bonne Terre, MO 63628 314/358-5000

## NEW JERSEY

CEDAR GROVE DIVERS SUPPLY 201/857-1748  
492 Pompton Ave., Rd. 23, Cedar Grove, NJ 07009  
National certified instruction, private or group lessons.  
Indoor heated pool, full service dive shop.

DOSIL'S SPORTS CENTER 201/787-0508  
261 Rt. 36, E. Keansburg, NJ 07734  
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LAKELAND SCUBA DIVERS 201/887-0194  
92 Route #10, E. Hanover, NJ 07936  
Certified instruction, PADI, YMCA, NAUI. Indoor heated  
pool, rentals, repairs, wreck dives weekly.

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Full service PADI training facility.  
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KINGS COUNTY DIVERS CORP. 212/648-4232  
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Dive the clear warm waters of NC on area's largest dive  
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PADI training facility, pro dive shop. Closed Wednesday.

HARRISBURG SCUBA CENTER, INC. 717/561-0517  
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trips. PADI training facility. Weekdays 6 PM-9 PM, Sat. 9-5.

MID-ATLANTIC SCUBA CENTER  
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3540 Street Rd., Bensalem, PA 19020 215/245-0141  
PADI instruction, sales, rentals, repairs, trips.

SMOKEY'S DIVER'S DEN 717/393-5333  
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Most complete pro service in North Texas.

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Sales, service, rental. Private dives to Utah's lakes.

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SEA VENTURES, INC. 703/425-7676  
Pickett Shopping Center, 9444 Main St., Fairfax, VA 22031  
Northern VA's complete dive shop.  
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2841 Rogers Dr., Falls Church, VA 22042  
PADI 5 Star instructional development center,  
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## WEST VIRGINIA

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U.S. 60 & I-64 Exit 15 at Carroll's 304/529-6622  
4901 U.S. Rt. 60 East, Huntington, WV 25705  
Ask for Charley. 304/736-3861

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849 Wisconsin Bay Rd., Ellison Bay, WI 54210 (Gills Rock)  
Air, equipment, rentals, wreck dives aboard 40' 'Neptune II'.  
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Discover southern New Providence diving. Wrecks, reefs, walls. Daily  
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Undiscovered & unspoiled! Virgin reefs, spectacular caves. Dive shop, boats, rental equipment, certification, great packages!	

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KILBRIDE UNDERWATER TOURS	809/494-2746
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UNDERWATER SAFARIS	809/494-3235
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Rhone & reef dives daily, PADI training facility, sales, rental, photo center, hotel dive/sail packages.	
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All inclusive travel/diving packages exclusively through Scuba Trips, P.O. Box 5503, Sarasota, FL 34277	
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AM, PM, North Wall & night dives. Individual & group personalized packages, SCUBA/photo rentals & complete training programs.	
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Brac Aquatics, Ltd.	800/327-3835
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3 tank dives, Little Cayman trips.	
CAYMAN ISLANDER HOTEL—GRAND CAYMAN	800/233-8880
Bob Soto's Diving Ltd.	800/327-3835
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Ron Kipp's CAYMAN DIVING LODGE	800/327-8223
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Cayman's 1st toll free number provides instant information & reservations for great wilderness, wall, reef & wreck diving.	

SCUBA SAFARI—Private Diving Tailored To You!	809/949-3742
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Casio, Puma diver's & scientific watches. Other brands available. Cheap!! Send \$2 for catalogue/price.	
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MACK'S DIVING OF JAPAN	
2-18-34 Nishiki, Naka, Nagoya 460, Japan	
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582-211-1772	
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593 Isa, Ginowan City, Okinawa, Japan	
Custom made wet suits, PADI instruction. Sales, repair, 3000 PSI air station, indoor pool.	

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BAY ISLANDS DIVE RESORTS	800/328-0734
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Personalized diving retreat, barrier reef, historic Port Royal Harbor, gourmet delights, windsurfing, sailing.	

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Beginner lessons, dive packages, certification, photography. Beautiful, exciting dives daily with PADI instructors.		
SUNDIVERS, JAMAICA LTD.	809/973-2346	
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Jamaica's 1st & only 5-Star PADI int'l training facility. Extensive sls. & svs., camera rentals, resort dive pkgs.		

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AQUA SAFARI, S.A. DE C.V.	011-52987-20101
Cozumel, Q. Roo, Mexico. Dive trips daily TX-800/392-4900 + 482	
except Sundays. Bilingual personnel. US-800/231-0629 + 482	
PADI training facility. Referrals, resort course. 713/482-1954	
AQUA TOURS	988/3-0227
P.O. Box 528, Cancun, Q. Roo, Mexico 77500	988/3-1137
Dive the Yucatan Reefs, daily trips to I. Mujeres Bay and Cozumel. Instruction, rentals, package and group rates.	
BAJA EXPEDITIONS, INC.	619/297-0506
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Personal service like you never dreamed possible in Mexico. For a wealth of free information call US office 206/441-3483 or write: P.O. Box 222, Cozumel, Q. Roo, Mexico 77600.	
DIVERS PARADISE: CLUB AKUMAL CARIBE. Furnished bungalow, 20' from beach, sleeps 6, daily maid service.	
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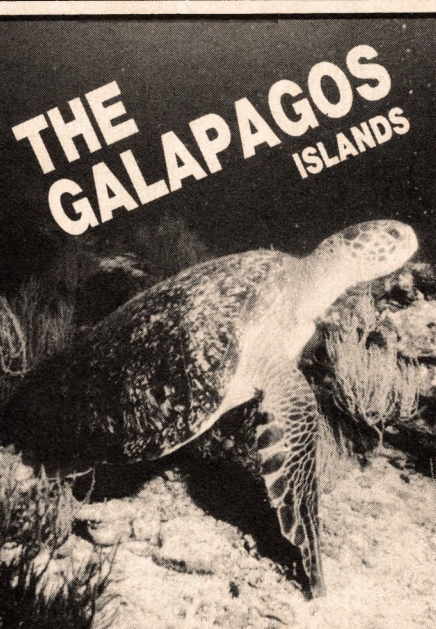
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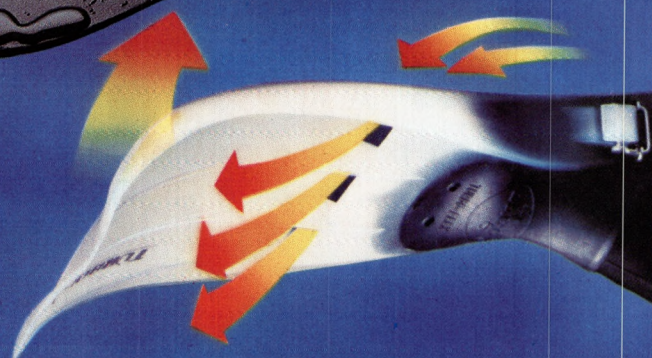
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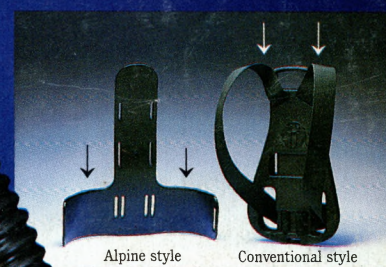
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